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NATIONAL PETROLEUM NEWS

Refining Technology

EDITION

In this Issue...

● Crude Takings Cut 20 Per Cent

Carter Oil Co. prorates its purchases in Oklahoma and Kansas fields, stating that full allowables, as set for April by the Oklahoma Corporation Commission represent more oil than its customers can take 17

● U. S. Can't Authorize Buying

Department of Justice says it cannot approve, in absence of legislative authority, any joint effort of oil companies to relieve the independent refiners located in East Texas 19

● Rebuilding a Penna. Refinery

A new TVP vapor-phase cracking unit, a benzol-ketone dewaxing unit, an expanded primary distillation capacity, and completely revamped steam, storage and piping systems make a most modern plant of this refinery R-147

● A Study of Russian Gasoline

Detailed analysis of a sample of Russian gasoline shows naphthenes compose from 28.5% of the lightest to 91.5% of a heavier fraction R-160

● Colloid Treatment of Water

Water may be treated with sulfuric acid and with a reactive colloid, at a cost of 3.23 cents per 1000 gallons of "make-up." Installation and operating costs compared R-167

Advertisers' Index.....R-175 and 64

Editorial Index.....R-145 and 32

APRIL 6, 1938

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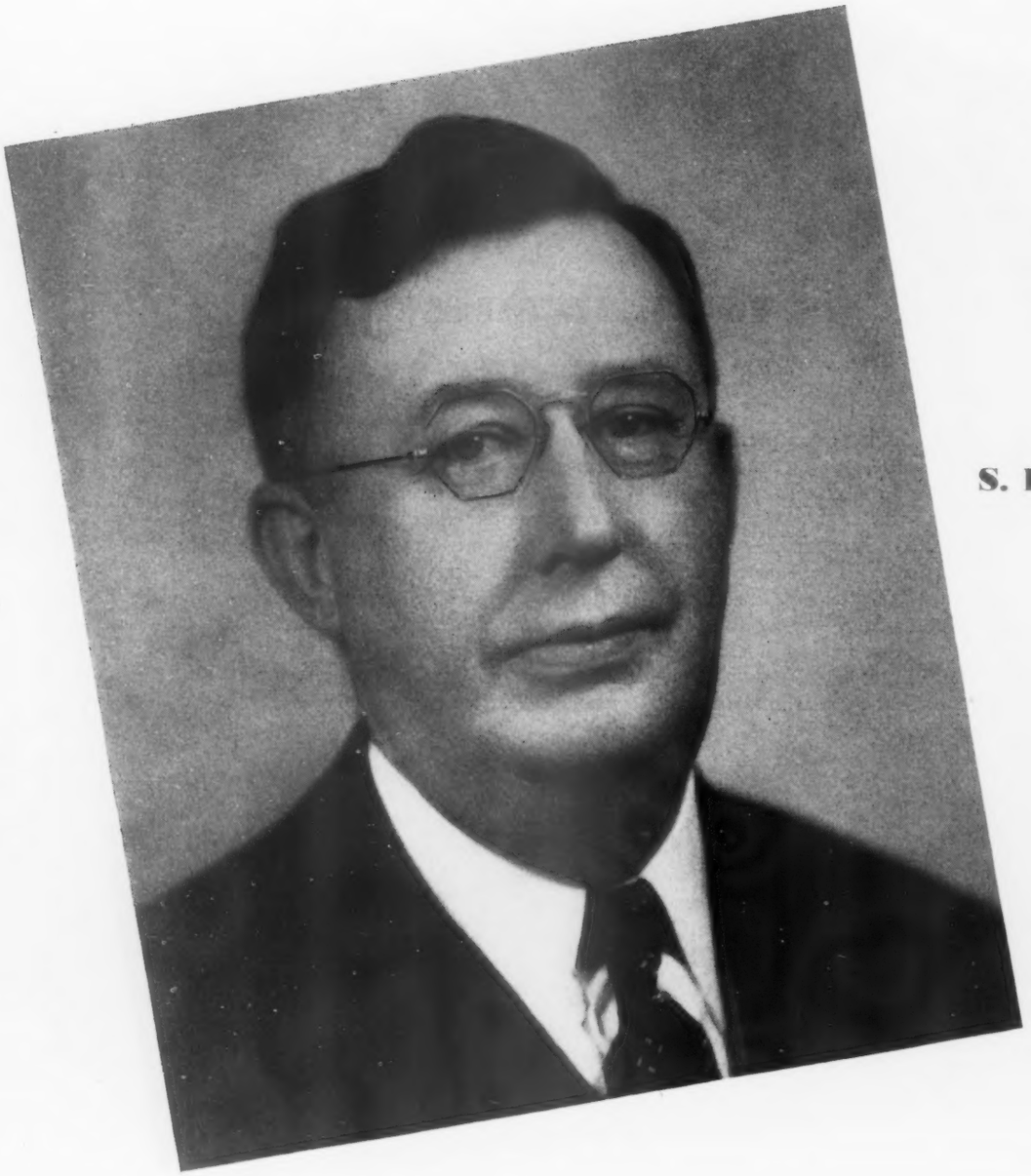

S. H. Trainor

● S. H. Trainor, of the Marathon County Oil Co., Wausau, is the new president of the Wisconsin Petroleum Association, elected at its recent annual convention in Milwaukee. He has been an independent jobber for twelve years, organizing his company in 1926 and remaining at the helm since.

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News By Teletype From 4 News Bureaus

National Petroleum News

News From Oil Industry Everywhere

VOLUME 30 WEDNESDAY, APRIL 6, 1938 NUMBER 14

Each Branch On Own Feet, Jobbers Cry

By Teletype
N. P. N. News Bureau

WASHINGTON, April 5. — The hearing of the Senate judiciary committee on the Gillette Marketing Divorcement bill (S-3752) ended here today with the announcement by Chairman Patrick McCarran of Nevada that opponents of the bill had requested time to appear at a later date. He said he would postpone the hearings for a "reasonable time."

Meanwhile, on the House side of the capitol, Chairman Lea of the House Interstate Commerce Committee, has referred the Biermann Bill (HR-10089), companion to the Gillette measure, to the Cole "oil sub-committee" for hearings, which are expected to start within a few weeks.

At today's hearings on the Gillette bill, Senator McCarran displayed two large sheafs of telegrams and letters, one sheaf "for" and the other "against" the bill.

The "for" communications were largely from independent jobbers and jobbers' associations in all parts of the country. The "anti" communications, he said, were from consumers, consuming industries, service station operators, co-operatives, one from the Oil Burner Institute, one from the California Oil & Gas Assn., refiners, truck operators, one from the statistician of the Nevada Tax Commission, and another from David W. Shaw, vice president of the National Assn. of Petroleum Retailers. A large share of the telegrams against the bill were from Pacific Coast states and McCarran's home state, Nevada.

Will Stop Subsidies

Two opponents of the bill who have requested time to appear before the sub-committee later are Eric V. Weber, president of the Ohio Petroleum Marketers' Assn., and Paul Blazer of the Ashland Refining Co., Ashland, Ky.

Chief argument of opponents of the bill appears to be that it will result in a higher cost to the consumers, although no

(*Continued on page* 18)

January 'Gas' Demand 6% Over January, '37

(Telegraph Bulletin)

NEW YORK, April 5. — Gasoline consumption in the U. S. in January totaled 1,458,545,000 gallons, an increase of 86,197,000 gallons, 6.28 per cent, over consumption in January last year, according to tax reports, the American Petroleum Institute stated.

This demand, however, was 156,804,000 gallons, or nearly 10 per cent under December. Detailed figures will be published in a forthcoming issue.

Mexico Muddle May Help U. S. Stocks

N. P. N. News Bureau

WASHINGTON, April 4.— Interior Secretary Ickes sees a possibility that the expropriation of oil company properties in Mexico may result in a reduction of U. S. stocks of crude and gasoline, which he has already said were "excessive."

Ickes said the effect of the Mexican action was decidedly an "if" question, but that it might result in either an increase in domestic production or a decrease in present stocks, to offset the volume of oil imported into this country from Mexico.

During 1937 the total imports of Mexican crude for consumption in this country were 3,512,000 barrels—about one day's domestic production—and imports of fuel oil for the year were 2,843,000 barrels.

3-Mile Deep Well

LOS ANGELES, April 2.— Continental Oil Co.'s K.C.L. A-2 —super deep test in the San Joaquin Valley—April 1 was drilling below 15,004 feet in a further demonstration that it is only a matter of time before we will have direct mail service through the earth to China.

Officials of the company said additional drilling would probably be limited to one or two more cores in the six-inch hole. Although hope for oil or gas production in this well has now been abandoned, thorough tests of the formation are being made at the bottom and will be made on the way out.

New Fund For Syphilis War To Spur Clean Toilet Drive

Developments described in this issue of NATIONAL PETROLEUM NEWS relating to its campaign for cleanliness in service station rest rooms and toilets, a cleanliness that is necessary to hold the business of a public constantly growing more critical of unsanitary conditions at stations, are as follows:

FIRST—The Senate has passed a bill appropriating a minimum of $13,000,000 for three years of U. S. funds to aid individual states in their war on venereal disease. A companion bill is pending in the House. (See accompanying article)

SECOND—Pay locks on station toilets are approved by motorist customers, in the experience of two dealers, and the revenue from them more than pays for keeping the toilet in spotless condition. (See article page 30)

THIRD—Women's reactions to stations with unclean toilets are discussed in a special article by a doctor's wife. (See article page 33)

* * *

Senate Votes $13,000,000 For War Against Syphilis

N. P. N. News Bureau

WASHINGTON, April 4.— The bill providing "federal aid" to states and other political subdivisions of the U. S. in stamping out syphilis has passed the Senate.

A companion measure (HR 4097) by Rep. Bulwinkle, North Carolina, has been set for hearing before the House Interstate Commerce Committee April 12.

Under the bill, $3,000,000 is authorized for each of the next two fiscal years; $7,000,000 for the following year and for each succeeding year "such sum as may be needed" to carry out the purposes of the measure.

The money would be allotted among the states by the U. S. Public Health Service in much the same manner as federal aid highway funds are now allotted, and the Surgeon General would be given authority to "prescribe such rules and regulations as are necessary."

Purposes of the bill, as set forth in its first paragraph, are to assist "states, counties, health districts and other political subdivisions of the states in establishing and maintaining adequate measures for the prevention, treatment, and control of venereal diseases; for the purpose of making studies, investigations, and demonstrations to develop more effectual measures of prevention, treatment, and control of venereal diseases, including the training of personnel . . . "

Lengthy hearings were held on the bill by a subcommittee of the Senate Commerce Committee which included Senators Copeland, New York, Nye, North Dakota, and Pepper, Florida, and the subcommittee's report summarized its findings as follows:

"The subcommittee concludes that this problem must be attacked, that the weapons of medicine and public health are adapted to make the attack, that the methods proposed in this bill are suitable to the needs, and that there is a public readiness for the undertaking. Only a sufficient armament is lacking, and this bill will supply that armament. We urge enactment of the bill."

Finds Public Is Ready

Most significant part of this summary is the statement "there is a public readiness for the undertaking." Ten years ago, or even five, the "public" did not discuss venereal diseases —the word "syphilis" never saw print, except in medical treatises

(*Continued on page* 29)

Backers of Marketing Divorcement Have Inning

(Continued from page 17)

opponents have appeared as yet. Proponents of the bill, as represented by the eight witnesses who appeared in the two-day hearings, said its passage will stop major integrated oil companies from subsidizing marketing losses with profits from other operations — producing, refining and transportation.

The second day's hearings were led off by Hugh F. Hall, representing the Indiana Farm Bureau Federation, who asked leave to file a statement on behalf of the measure.

Carol O. Beroth of Chicago, representing the Illinois Petroleum Marketers' Assn. was the next witness, presenting the committee for inclusion in the record a copy of the resolution passed by his association favoring marketing divorcement as proposed in the Gillette-Biermann bills.

Beroth also introduced into the record a copy of an article from NATIONAL PETROLEUM NEWS of March 30, showing profits of the Great Lakes gasoline pipeline, as reported in its annual report to the Interstate Commerce Commission.

Majors' Advantages Cited

Beroth said the independent jobber cannot exist against the "subsidized" marketing operations of the integrated companies. He said the major company had a 1.5 cent a gallon advantage over the independent on production, and that, by moving his gasoline to Chicago by pipeline, whereas the independent must move it by tank car, this advantage grows to 3.5 cents a gallon.

Senator Borah, a member of the sub-committee, suggested that the pipelines should be divorced from the other branches also, and Beroth agreed, saying he would like to see a "stronger bill" than the Gillette measure — one making every branch of the industry "stand on its own legs," he said. Borah is author of a bill (S-1398) to divorce pipeline operation from the others.

Borah Asks About Prices

Russell S. Williams, representing the Indiana Independent Petroleum Assn., next witness, said that major company dealers get the advantage of the profits the integrated companies make in other branches, but that the independent jobber must pay for his gasoline at the market price and make an effort to sell it at a profit.

Senator Borah wanted to know if the practice Williams complained of didn't lower the price to the consumer, and the witness agreed it did. Williams, too, said he thought that the transportation advantage enjoyed by pipeline users should bring lower prices.

He pointed out that Rule 6 under the NRA code, had been aimed at making each branch of the industry stand on its own feet, but that the integrated companies didn't abide by it.

Borah asked if the legal aspects of the bill had been gone into, and Paul E. Hadlick, secretary of the National Oil Marketers Assn., who has been a moving factor behind the bill, said he believed it to be constitutional, in view of several Supreme Court decisions on other legislation, most recent of which was the ruling upholding the Utility Holding Company Act.

Roy L. Brecke, executive secretary of the Wisconsin Petroleum Assn., was fourth and last witness at the second day's hearing, also contending that the independent jobber could not exist in the face of the "subsidized" competition by the integrated companies.

He pointed to a survey of the Wisconsin State Marketing Department which showed that the cost of marketing a gallon of gasoline by some of the companies ranged from seven to 28 cents, but that this loss was taken care of with profits from other operations.

New Rates Help Majors

Brecke also pointed to the recent 10 per cent freight rate increase, which, he said, "gives the majors a larger advantage", since they ship by pipeline, while the independent must ship by rail.

At the close of the day's hearings Senator McCarran asked if any of the representatives of associations or other spectators at the hearing wanted to be heard either for or against the bill. No one responded, and the Senator declared that "if there is any one here who is intent on appearing against, or for, this bill, and is just holding off for the sake of delay, you're going to get left."

He said, however, that he would recess the hearings for a "reasonable time", as he had heard some criticism because the hearings were called without a long enough notice.

First Session Is Brief

First session of the Gillette bill hearings March 31 was brief, lasting about an hour.

"The people I represent," said Hadlick, the first witness, "are engaged in marketing—wholesale and retail. They depend for their existence upon making a profit out of that operation alone. Through control features in the production and refining of oil—some legalized by acts of Congress, others illegal as was disclosed in the recent trials at Madison—these major oil companies are enabled to absorb losses in marketing and yet show an overall profit on their operations. By doing so they crush out the very existence of the Independent marketers."

With the Connally Law and other "control" features fortifying their profits from pipelines, tankships and barges, he added, the major companies have made an overall profit while losing in marketing.

Hadlick cited figures showing profits from pipelines. He also called attention to reports of The Texas Co. and Pure Oil Co. which told of losses in their marketing operations. He said that the ability of Standard Oil Co. of Ohio, which is a refiner but without production of its own, to operate profitably was due to its pipeline profits.

Profits of the Standard of Kentucky, a marketing company only, were attributed by Hadlick to the "favorable" prices it enjoys from the Standard of Louisiana. Most of these profits, he added, come from charging the consumer freight rates when the company hauls in its own tankships and barges.

Cites Colonial-Beacon Loss

He pointed out that the Colonial Beacon Oil Co., a subsidiary of Standard of New Jersey, engaged in refining and marketing "has consistently shown losses in its opereations." Likewise, Standard of Nebraska, a marketing company which, he said, enjoys tremendous advantages over smaller jobbers, showed an operating loss of $133,206 in 1937.

"The abuses existing in oil marketing through the subsidized competition of the major oil companies," Hadlick declared, "are far worse than those which prompted Congress to adopt the Hepburn Act more than 30 years ago to divorce the railroads from their operation of coal mines and timber lands.

"We do not fear the competition of the major oil companies if it had to stand on its own base," said the N. O. M. A. secretary in conclusion. "Because of consistent policy over these many years in operating their marketing departments at a loss the only way we can see out of our difficulty, and the only way to prevent complete monopoly in the oil industry, is the prompt passage of legislation sponsored by Senator Gillette."

Next witness was A. C. Gienapp, Manchester, Iowa, secretary of the Iowa Independent Oil Jobbers Assn., who read into the record a resolution adopted by that association urging enactment of the Gillette-Biermann Bill. He said the association represented 750 Independent oil jobbers in Iowa.

Declaring that the jobber's margin has been steadily narrowed, until now he has only a bare existence, Gienapp urged enactment of the Gillette Bill to bring relief.

H. F. Remington, Reading, Pa., retailer, distributor and stockholder in a co-operative jobbing company, told of major companies selling to consumers at lower prices than to dealers who take much larger quantities. He pointed to the costly service stations leased out for "ridiculous" rentals as further

Call on Hull In Mexican Tangle

By Teletype
N. P. N. News Bureau

WASHINGTON, April 5. — Three representatives of American oil companies whose properties were expropriated by the Mexican government called on Secretary of State Hull today, but on their departure the secretary said there was no news. He said the visit resulted only in "interchanges of information of a minor character" regarding the situation.

The callers were W. S. Farish, president of Standard of New Jersey, Eugene Holman, president of Husastec Petroleum Co., and T. R. Armstrong, representing Standard of New Jersey.

Mexican Ambassador Castillo Najera called on President Roosevelt at the White House today, also, and on leaving said he had called to express the appreciation of President Lazaro Cardenas for the satisfactory manner in which negotiations over the confiscation have proceeded.

He also expressed Cardenas' thanks, he said, for President Roosevelt's expression of last week on the oil situation.

The President declined to discuss Najera's visit at his press conference late today.

evidence of "losses" by the major companies in marketing.

Senator Borah came in at this point. He asked Remington if there was "any competition between the major oil companies?"

"Well, they all sell to dealers at the same price," Remington replied.

"Do the four or five big companies fix the price?"

"It would appear so," said Remington. And, replying to further questions, he agreed that this condition had existed for four or five years. "I don't believe that an oil company man has called on me in a year soliciting business," the Pennsylvanian added.

Next, Richard E. Breed, Baltimore, of General Refining Co., an Independent oil jobbing company, took the stand.

Enactment of the Gillette Bill, Breed said, would help the consuming states by stopping the major companies from taking their profits on a gallon of gasoline, not in the state where it is sold, but where the crude is produced, refined and transported.

During Breed's testimony about the major companies subsidizing their marketing losses with pipeline profits, Senator Borah, who is author of a pipeline divorcement bill, interposed to say, that the pipelines should be a separate operation.

After Breed concluded, Chairman McCarran asked:

"Is there anyone here in opposition to the bill?"

There was no response. However, there were present as observers, representatives of associations of producers and refiners.

Senator Borah remarked that he had received a good many telegrams and letters in favor of the Gillette Bill, but none against. He said this was "remarkable," adding that there must be some "loophole" in the bill.

At the close of the March 31 session, McCarran put into the record a sheaf of telegrams and letters on the Gillette-Biermann Bill. All but one, a radiogram from the American Steamship Owners Assn., favored the measure and urged its enactment.

The steamship association protest charged that divorce of the marketing branch would increase the cost of petroleum products, pointing out that fuel oil was a big item of expense in shipping operations.

Members of the Cole sub-committee which will consider the Biermann Bill in the House side of the Capitol include Representatives Cole, Maryland; Pettengill, Indiana; Kelly, Illinois; Mapes, Michigan, and Wolverton, New Jersey.

Divorce Law Viewed As Bar to Monopoly

INDIANAPOLIS, April 4.—Endorsement of the bills now before both houses of Congress calling for divorcement of marketing from other operations in the oil industry is given in a report made by a special committee of the Indiana Independent Petroleum Assn.

The committee was appointed at the annual meeting of the association here March 2-4, and was authorized to contact independent refiners and to urge them to unite in an effort to secure relief from present conditions described as injuring both independent refiners and jobbers.

Russell S. Williams, head of the Bonded Oil & Gas System, was chairman of the committee. He appeared in Washington before the Senate committee conducting the hearing on the Gillette divorcement bill.

The report points to the Group Three price basing system, as used in establishing detail markets in the middle west, as being a protection to the independent marketing branch because geographic advantage was not considered an element by which a competitor would lower his price in competitive bidding.

"Then a transportation advantage was retained as a just departmental profit," states the report.

Referring to the greatly increased use of gasoline pipelines, water transportation and the utilization of large transport trucks direct from integrated refineries, the report continues, "The independent marketer is in no sense envious of the integrated competitors' advantageous position and size, but when he is confronted with the reality that, due to his limited operation, he cannot build gasoline pipelines, utilize terminals or transport trucks, then he becomes alarmed on awakening to the fact the savings enacted by the integrated competitors in the profitable departments are being used to subsidize a demoralized marketing department to such an extent that he is actually faced with destruction."

Pointing to the passage of the Robinson-Patman act as preventing the granting of certain preferred customer privileges and prices that would hinder and destroy less fortunate competition, and thereby showing the intent of Congress to protect the small business man, the report of the Indiana marketers goes on to say there is now shown a need to bring about a similar result in industries where there is integrated operations.

Hits Gasoline Trades

Unfair methods of competition which need to be eradicated, in the eyes of the Indiana independents, include the practice of subsidizing low-gallonage dealers, who in turn cut the price, lowering the market. Any gallonage increase resulting from this practice must be had at the expense of marketers not subsidized, the report brings out.

The principle of profitable average markets, as this policy is designated in the trade, the report continues, "is to keep 80 to 90 per cent of your markets on a good price basis and use the 10 to 20 per cent of your marketing territory to establish a low marketing price so as to destroy, or at least intimidate, competition."

The Indiana report also attacked the interchange of gasoline to save transportation costs as destructive to "independent marketing companies who are not permitted to participate in the exchange of products."

Evidently anticipating the objection that such transportation savings to the industry might be a saving to consumers as well, the Indiana report declares that, after independent competition is destroyed, the integrated monopoly would impose high and arbitrary prices.

Monopoly Feared

"An integrated company finds itself in position with the cooperation of other integrated companies, to establish high prices in various departments of their industry," the report asserts. "For illustration: Today and for the past several months there has existed a high price on crude oil and a very low price on refinery gasoline tank car price, and a reasonable retail market. The result is that the integrated company has the advantage of profitable crude and profitable wholesale prices to jobbers; while the independent refiner during this period faces financial destruction.

"Tomorrow this same integrated unit may maintain high crude prices, high refinery tank car price, high transportation prices and low dealer prices. In that case the independent marketer is threatened with destruction. Again this same integrated unit can maintain high jobber prices, high transportation recovery prices, high refinery tank car prices and very low crude prices. In this case the independent crude producer suffers. If the integrated company's ultimate sales recovery is at a satisfactory profit, it therefore is contended."

The same principle is pertinent as that which prompted the government to prohibit meat packers from retailing meats, the report continues. Therefore, to eliminate the possibility of monopoly oil companies should be required to operate each branch of the industry on a profitable basis, insured "by adoption of a law that will actually segregate the various branches of the petroleum industry."

Members of the report committee besides Chairman Williams are J. E. Fehsenfeld, Crystal Flash Petroleum Corp.; J. Ivan Harris, Indiana Farm Bureau Co-operative Assn.; O. B. Perine, Perine Oil Refining Co., and George W. Hofmayer, secretary of the Indiana Independent Petroleum Assn.

Reforming Unit For Cal. Plant

LOS ANGELES, April 4.—Construction of a 4000-barrel reforming unit will be started during April by Wilshire Oil Co. at its Norwalk plant. Primary object is to increase the company's output of high-octane gasolines. Manufacture of straight-run gasoline will be discontinued after completion of the unit in July.

The expansion will permit a 1500-barrel increase in production of "Poly" brand gasoline from a year-old catalytic polymerization unit. This increase of the 72-73 octane product will allow an additional output of a 70-71 octane product, "Super-Economy." "Economy-Regular," a third product, will be 100 per cent cracked gasoline. It is now a blend of cracked and straight-run products.

The reformer, licensed by Universal Oil Products Co., will process a 40-45 gravity naphtha of 275 initial, 475 end point, and 45-50 octane number, it is anticipated. Plans also call for installation of a crude heater to provide more flexibility to overall refinery operation. It is designed to top about 18,000 barrels of crude per day, as against 14,000 barrels by previous operations. All construction will be by Fluor Corp.

Ohio Oil Makes 1937 Report On Discovery Wells

N. P. N. News Bureau

CLEVELAND, April 4.—As the Ohio Oil Co. rounded out its 50th anniversary in 1937, President O. D. Donnell reported to stockholders a consolidated net profit of $11,862,107, after all charges, equivalent to $1.31 per share.

This compares with 1936 profits of $7,881,571 or 70 cents per share. Net sales during 1937 were $64,165,395, an increase of 21 per cent over 1936 net sales of $52,991,777.

Primarily a crude producer (selling to the trade 6 out of 7 barrels), Ohio Oil has shown no startling change in gross production since 1933, but has added 118,000 acres to unoperated and operated lands under lease and fee since that date.

During 1937, the company reported, a discovery well was completed in the Canal area, Kern County, Cal., a discovery well opened the Noble pool, Richland County, Ill. (Ohio has leased 212,000 acres in the Illinois Basin); a discovery was made in the Minnelusa sand, Lance Creek field, Niobrara County, Wyo.; 13 wells were completed in the Cotton Valley field, Webster Parish, La.; drilling was substantial in Lea County (New Mexico) fields, and 7 additional wells were drilled in the El Segundo field, Los Angeles County, Cal.

Ohio Oil's production activities resulted in 233 new oil wells during the year to total 11,373 producers now being operated. The gross oil produced amounted to 27,232,003 barrels, compared with gross oil production in 1936 of 23,023,936.

Capital Expenditures

Capital expenditures during 1937 were listed as follows:

Cost of wells	$8,825,288
Lease acquisitions	2,028,358
Leasehold equipment, etc.	3,040,459
Refining, marketing	1,421,977
Pipelines, gas companies	1,090,913
Total	$16,406,995
Less property sold, abandoned, or written off	7,115,849
Capital increase	$ 9,291,146

Without material change in miles of pipe, the Illinois Pipe Line Co., transportation subsidiary, flowed 58,123,323 barrels of crude compared with 52,313,000 barrels in 1936. The increase was accounted for by increased production in Wyoming and Illinois.

"Considering increased operating costs and the downward trend in realization experienced during the final quarter (of 1937), refining and marketing operations reflected a satisfactory profit," President Donnell commented. Refining and marketing sales were up 9 per cent over 1936. Linco and Marathon products were marketed in no new territories, but increases to plant were made in existing sales areas.

Crude Stocks Increase 1,177,000 Bbls.

By Teletype
N. P. N. News Bureau

WASHINGTON, April 5. — Stocks of crude petroleum on March 26 were 307,557,000 barrels, compared with 293,587,000 barrels on March 27, 1937, the Bureau of Mines reports.

The March 26 figure represents an increase of 1,177,000 barrels over March 19 stocks, and more than 3,000,000 barrels over March 5 stocks, as reported by the bureau.

Stocks by grades, showing changes, follow:

Grade	Mar. 19	Mar. 26	Chng.
	(Thousands of barrels)		
Penna. grade	4,447	4,462	+ 15
Other Appal.	927	967	+ 40
Lima-NE Ind.-Mich.	1,220	1,352	+ 132
Ill.-SW Ind.	9,461	9,539	+ 78
N. La. & Ark.	8,560	8,702	+ 142
W. Tex. & SE New Mex.	30,810	31,205	+ 395
East Texas	26,241	26,780	+ 539
Oth. Mid-Cont.	127,449	127,192	— 257
Gulf Coast	24,143	23,875	— 268
Rocky Mts.	23,696	23,733	+ 37
California	26,226	26,293	+ 67
Foreign	3,550	3,757	+ 207
Total reptd.	286,730	287,857	+1,127
Unreported	19,650	19,700	+ 50
Total stocks	306,380	307,557	+1,177

Named Technology Head

TULSA, April 4. — H. H. Power of Austin, Texas, department of petroleum engineering, University of Texas has been named national chairman of the 1938 Topical Committee on Production Technology of the American Petroleum Institute's Central Committee on Drilling and Production Practice, J. T. Hayward of Tulsa, Barnsdall Oil Co., chairman of the Central Committee, announced today.

Oklahoma Lease Auction

WASHINGTON, April 4.—Public auction of oil and gas leases on approximately 255 acres of public land in the West and Middle Red River oil and gas fields, near Grandfield, Tillman County, Okla., will be held May 9 at the Wichita Falls federal building, the General Land Office announces. Further details may be obtained from the office of the petroleum engineer, Geological Survey, Wichita Falls.

Drive Against 'Gas' Tax Evasion Netted 221 Convictions in 1937

NEW YORK, April 4.—In 13 states during 1937 attempts to evade gasoline taxes totaling $264,711 were disclosed and authorities prosecuted 227 criminal and 44 civil actions, the Central Gasoline Tax Evasion Committee reported today to the American Petroleum Industries Committee.

In making the report, F. V. Martinek, chairman of the Central group, expressed the belief that co-operative effort by the oil industry had resulted in the collection of additional hundreds of thousands of dollars both in federal and state gasoline taxes, which might otherwise have been lost.

Judgments obtained totaled $17,348 and collections $56,166 in the civil actions, which involved gasoline taxes totaling $89,795, the report indicated.

Gasoline taxes totaling $174,916 were involved in the 227 criminal actions instituted during 1937. Convictions totaled 221, with only seven acquittals. Fines to the total of $18,319 were imposed, while jail sentences ranged as high as 10 years.

Of the 44 civil cases, 23 were instituted in South Dakota, and of the criminal cases, 193 were instituted in Kansas. Fines totaling $7149 were imposed in Kansas on 188 convictions.

$127,000 in One Case

The largest amount of taxes involved in a single criminal action was $127,000, resulting from evasion of motor fuel taxes in Illinois prior to October, 1930. This resulted in a second conviction on Nov. 2, 1937, the first having been reversed and remanded by the Illinois Supreme Court. Three other cases were brought in Illinois, with suspicion of gasoline tax evasion disclosing thefts of gasoline from tank cars.

While such prosecutions tend to discourage gasoline tax evasion, Chairman Martinek reported, constant vigilance is necessary to prevent loss of state and federal gasoline tax revenue through misbilling of tank cars, blending of non-taxable products with motor fuel; interstate transportation by motor truck; and intended delinquencies. Filing of fraudulent claims for refunds was held to be potentially a large source of loss, with state departments hard pressed to handle the claims which run as high as 22,000 a year, with about one-third believed to be falsified. A fraudulent refund case recently uncovered in Minnesota was reported to indicate a loss of $5000, while two cases found recently in Missouri involved taxes totaling $15,000 and $5000, respectively.

Evasion involves losses in federal revenue as well as in state gasoline tax income, the report said, the multiplicity of duties imposed upon federal collectors handicapping their work.

States in which the central committee is co-operating with state and federal authorities to prevent such losses are Colorado, Illinois, Iowa, Indiana, Kansas, Michigan, Minnesota, Missouri, Montana, North Dakota, Wisconsin, and Wyoming. In the case of Missouri, evasion of municipal gasoline taxes successfully was prosecuted in St. Louis, St. Joseph, Bowling Green, and Moberly.

* * *

NEW YORK, April 4. — The first arrest in a state-wide roundup of gasoline tax evaders in Minnesota has been made by an assistant of the state oil inspection department, the American Petroleum Industries Committee reported today. The alleged tax evader is charged with having swindled the state out of $2500 in bogus tax refund claims by using post-office boxes and assumed names within a radius of 50 miles of his home. It was asserted that he obtained sales blanks in various places, filled them in, and stamped them "paid" with rubber stamps. His affidavits were made before notaries who did not know him.

The Minnesota oil inspection department is investigating a number of other cases where fraud is suspected, the A.P.I.C. said. Besides proceeding against the out-and-out swindlers in gasoline tax refund claims, the state is checking claims to discover violators of the law, chiefly residents of rural communities, who fail to make proper deductions for gasoline used in passenger cars and trucks used on the highways. While these cases involve smaller sums, in the aggregate they run into thousands of dollars, authorities said.

D. C. Tax Collections

WASHINGTON, April 4.—Gasoline taxes collected by the District of Columbia in February amounted to $184,923.54—representing 9,246,177.4 gallons—compared with $177,911.23 on 8,895,561.6 gallons in February, 1937, district tax collector reports.

Confiscation of 'Hot Oil 'Upheld

AUSTIN, Texas., April 4.—A sweeping decision upholding the Texas "hot oil" confiscation act was announced last week by the Third Court of Civil Appeals, in the suit of Skipper Bivens Oil Co. et al against the state.

Constitutionality of the act was argued on an appeal from a district court decision upholding the state in confiscating 10,000 barrels of oil charged to be illegal in that it was produced in violation of the conservation laws and the regulations of the Texas Railroad Commission.

Plaintiffs in the action had contended the oil was in steel storage and was a useful article of commerce and not inherently vicious and was not in fact a nuisance and could not be made so by legislative fiat; and that since the oil was produced prior to May 11, 1935, the act was retroactive and void as to it.

"Probably no legal principle is more firmly grounded in our jurisprudence than that the state has power to conserve the natural resources within its boundaries and to enact such laws, and through properly constituted legislative agencies promulgate such regulations thereunder, as may be necessary or appropriate to effectuate that objective," the court stated.

The purging of oil of its illegality through moving it into commerce under judicial sale, the court held, does not defeat the purpose of the proration laws as predicated upon market demand.

The court concluded the act was not unconstitutional as being retroactive with respect to already existing illegal oil but "merely afforded a remedy for the abatement of an existent nuisance."

Ask Change In Rating

TULSA, April 4. — Six independent refiners in Oklahoma have asked the Oklahoma state insurance board to grant them a substantial credit allowance in the rating of the cracking stills at their plants, because of their independent technical inspection service.

Ben P. Piepgrass of the Bell Oil & Gas Co. is chairman of the committee. Other refineries in the group are Black Gold Refining Co., Oklahoma City; Cosco Oil Co., Wynnewood; Cushing Refining & Gasoline Co., Cushing; Johnson Oil Refining Co., Cleveland, and Sunray Oil Co., Allen.

Profits Tax Out

WASHINGTON, April 5.—Senate Finance Committee today reported the tax revision measure, after eliminating from it all semblance of the undistributed profits tax. Neither the fuel oil tax proposed by Representative Boland in the House, nor any change in depletion allowance was mentioned in the bill.

Kaye Joins Western Refining Concern

TULSA, April 5.—Emby Kaye for several years Skelly Oil Co.'s vice president in charge of refining, has resigned to become affiliated with the Wasatch Oil Refining Co., and subsidiaries, with headquarters at Salt Lake City.

K. J. Smith, superintendent of Skelly's refinery at El Dorado, Kans., for several years, will continue in that capacity and also has been named acting head of the refining division. He will continue to make his headquarters at El Dorado.

The Wasatch company operates a 3400-barrel refinery at Woods Cross, Utah, and recently announced plans for construction of plants at Pocatello, Idaho, and Spokane, Wash. Railroads serving that area have granted advantageous rates from the Montana fields to refining points.

Kaye has on several occasions in the past been called in by the Wasatch officials as consultant on refining problems.

Drilling Revenues

N. P. N. News Bureau

TULSA, April 4. — Oil wells drilled on the Oklahoma state capitol grounds have paid to the state $1,642,970, according to state reports. The general fund has received $421,348; the capitol building and armory fund has received $1,000,000, and $20,000 has been held in escrow. The remaining $201,662 has been deposited to the credit of the public building fund.

All the revenue from the wells now will go into the public building fund until June 30, 1939, after which date the revenue will revert back to the state's general fund.

New 6-inch Oil Line

TULSA, April 3. — The Continental Oil Co. has started construction of a 6-inch oil pipeline from Ville Platte to Tepetate, in Evangeline Parish, La. The line will flow 12,000 barrels daliy, linking the two fields with the company's deep water terminal at Lake Charles.

Slant Drilling Ruled Trespass

N. P. N. News Bureau

LOS ANGELES, April 2.—Is the owner of a surface location in or near an oil field entitled to disregard property lines and let his drill wander—or be directed—so as to tap sands underlying another piece of surface property?

This highly controversial issue was answered in the negative by the California supreme court last week in denying a hearing on appeal covering four identical suits.

In effect the court ruled that invasion of subsurface oil property through slant or directional drilling constituted trespass. Denial of this hearing by the high court supports a ruling by the Third District Court of Appeal, which reversed judgments by a superior court.

Principal defendant in the case was Bell View Oil Syndicate, which was complained against by Alphonzo E. Bell Corp. Both companies owned surface locations in the Santa Fe Springs oil field, but separated by a surface distance of 640 feet.

The complaint alleged the defendants drilled two wells from surface locations on their property, but that well surveys made by the defendants showed the holes had drifted and invaded the plaintiff's property.

Following these surveys the wells were completed and were placed on production in 1929, according to the complaint, and have produced oil and gas continuously since that time. The original action was to recover the value of oil and gas removed by these trespassing wells and to enjoin further production.

Now that the question of trespass of sub-surface rights has been decided, the case will be tried on its merits.

Jackson Says 'No' to Plea From East Texas Refiners

N. P. N. News Bureau

WASHINGTON, April 4.—The Department of Justice will not sanction—in the absence of legislative authority—any gasoline buying programs such as were charged in the oil indictment on which 16 oil companies and 30 oil men were convicted Jan. 22 at Madison, Wis.

That was the position taken by Acting Attorney General Robert H. Jackson in a letter dated March 25, which has just come to light, commenting on the suggestion of independent refiners in East Texas that the Roosevelt administration encourage the major oil companies to resume buying in that field.

In their pleas to Washington, the refiners pointed out that for 20 years they had been depending on major companies as a marketing outlet and that at that time, early in February, the major companies had ceased buying because of "fear" of the Madison decision. It was suggested that President Roosevelt, if necessary grant "executive clemency" to encourage resumption of major company buying.

H. B. May, Tyler, Texas, president of the East Texas Marketing Assn., telegraphed a lengthy protest to Washington some weeks ago urging such action (See, N.P.N., Feb. 16, page 18). Since then other protests have been received, some complaining that the posted price of East Texas crude was "too high."

Jackson's comment apparently applied to "buying programs" and not to individual purchases by individual companies.

Jackson's Statement

Referring to the May telegram, Jackson said:

"Similar complaints have been received by this department from other independent refiners. The complainants assert that the recent narrowing of the spread between the price of crude oil and refined gasoline has made it impossible for them to continue operation at a profit. They believe that this condition has been caused by the conviction of the major oil companies at Madison, resulting in the abandonment by the major oil companies of gasoline buying programs which were found to violate the anti-trust laws.

"The department of justice fully appreciates the difficulties with which the independent refiners are now confronted. However, a renewal by the major oil companies of buying programs of the type condemned by the court and jury in the recent oil prosecution, in the absence of legislative authority, could not receive sanction."

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One Plank in a Platform For a Sounder Oil Industry

Broader tank car markets.

More refiners, including majors, selling in those markets and more jobbers buying in them also.

Both buyers and sellers **Daily** making completed sales for prompt shipment of unbranded products.

Private Brands Set Standards For Entire Industry to Study

By WARREN C. PLATT, Editor

Some of the largest and strongest oil jobbers built their businesses by selling under their own private brands.

Some of the largest and strongest oil jobbers today—if not THE largest and strongest—continue in business selling under their own private brands.

In support of this statement we cite the Milton Oil Co., of Sedalia, Mo. which, after starting from scratch with no capital worthy the name 18 years ago, now does more than 20,000,000 gallons a year through 30 of its own bulk plants and more than 500 dealers. We could cite others today but refer to the Milton Oil Co. because of an excellent story on its history and methods printed in last week's issue of NATIONAL PETROLEUM NEWS.

Every oil jobber should read that story for it will show him what a truly Independent jobber is, one who not only owns his own business but buys where he wants to and sells under his own name and brand.

Every major oil company executive also should read that story, for it will arouse his greater respect for the Independent jobber as a competitive factor in this business, who can sell goods at a profit, and in increasing amounts, each year despite the national brands of these executives. Also such appreciation of the strength and true worth of the Independent jobber with an Independent brand, may prompt these major executives to realize that perhaps the oil industry would be better off economically and politically if it had many more of them.

The industry would be better off economically because these private brand jobbers, absolutely detached from any refinery, producing or pipeline connection, provide excellent measuring sticks for the efficiency of both majors and national brand jobbers. These private brand jobbers must operate on substantially the same margin as the national brand jobbers and supply the advertising cost of their brand in addition, while the national brand jobber has that furnished for him at a cost to his supplier of a quarter to a half cent or more, together with sales promotion helps, specialty salesmen, "pep" talkers and station inspectors—all furnished by the national brand companies free of charge.

The private brand jobber, on his own contract buying, probably does make a little better deal with the refiner in most cases than the national brand jobber, which better deals ARE NOT reported to the price reporting mediums for the obvious reason that the national brand jobbers' contracts say that, no matter how cheaply the private brand jobbers may buy, the national brand gasoline is to be delivered to the national brand jobber at the same price. The unbranded gasoline which the purchasing jobber, like the Milton Oil Co., buys he must give a trade standing, by establishing his own brand on it AND AT HIS OWN EXPENSE, not at the expense of his supplier.

The whole economic effort of the national brand jobber is to keep the private jobber continually under the extra burden of having to supply the trade standing of his gasoline at his expense but do it out of the same gross marketing margin as the national brand jobber enjoys who gets the trade standing of his gasoline given him free. In this, the national brand jobber, of course, has been supported by the sales departments of the major oil companies.

The oil industry for years has refused to see that the private brand jobber is buying one kind of gasoline and the national brand jobber an entirely different kind, even though the specifications may be the same. Little wonder, therefore, that the industry has been torn with "price cutters" like the "tracksides" and other differential operators, when this unbranded gasoline has been trying to seek the market without the aid of a national brand, while the owner of the national brands—and their jobbers—say that their brands must always be sold to the jobbers and to the consumers at the same price as the so-called unbranded gasoline.

So, when the private brand jobber has started at scratch and developed a big business under these handicaps, the results certainly indicate that his policies and methods should be closely studied, for obviously he is doing something which a lot of other people do not seem to be doing, and which would indicate a more efficient operation.

But in addition to the value of these private brand businesses being good measuring yardsticks for the whole industry, there is the fact that the flying of their brands at their service stations and dealers tells the public that here is competition. It is the kind of competition that the public can easily understand. These majors are busy cutting each others throats a good bit of the time but the industry never gets credit from the public for such competition, and the stockholders and all in the industry lose.

But the flags of private brands like that of Harry Milton, do prove to the public real competition in this oil business.

Industry's Advice Asked On Gasoline Price Reporting

By WARREN C. PLATT, Editor

We invite every one in the oil industry to participate in a mail conference on any improvements or changes that should be made in the reporting of prices in the oil industry's markets.

Our first request is for discussion of the gasoline tank car markets, particularly in the middle west. Following the threshing out of all points in connection with these markets, we propose holding a general mail conference on all other markets and prices involved in the oil industry.

The "conference" is not confined to the mails by any means. Personal discussions are invited but, because of the limitations of geography and time, most of the conference will necessarily be by mail. This will permit of the most careful study of all suggestions.

Below are copies of letters being sent to all refiners in the country and to all subscribers of the OILGRAM. We would like to send them to every one in the oil industry but that, obviously, would be quite an expensive job, especially these depression days. However, we appeal to all in the industry to read these letters and to write us fully and freely in regard to any ideas or suggestions each person may have. Your advice and comment, I assure you, are earnestly and sincerely sought.

Please address all your comments to me. Thank you for your co-operation.

Letter to OILGRAM Subscribers

I am sending the attached copy of a letter to all refiners in the country to gather ideas and suggestions for any improvements in the OILGRAM service.

But I shall appreciate your study of the letter and any advice that you can give in regard to the points raised.

I also am printing this letter in NATIONAL PETROLEUM NEWS in order to solicit the thoughts of as many in the industry as possible.

Please do not hesitate to let me have your ideas in detail because that is the only way for us to make sure that our product best fits the needs of the industry.

Thanks very much for your attention.

Letter to All Refiners

We are investigating whether our present method of reporting and showing petroleum prices adequately covers the practices of the industry and the needs of our subscribers.

At the moment we are confining our investigation to gasoline tank car market prices in all markets of the country. We would greatly appreciate your advice and information on the following points in as much helpful detail as you care to give

Do you have or POST tank car prices on gasoline?

To other refiners?

To jobbers (bulk plant owners)?

To brokers?

To tank car consumers?

If you do not post to one or all of these do you contemplate selling or POSTING PRICES to any of these in the early future?

Are the above postings on BRANDED or UNBRANDED gasolines?

In the sale of gasoline to the large tank car consumers do they buy it and do you sell it as your BRANDED gasoline, or do you sell it on your specifications as UNBRANDED or on their specifications also as UNBRANDED?

Is the tank car business to large consumers increasing or decreasing and what is your opinion as to its future change?

Is the tendency for this large consumer business to go to UNBRANDED gasolines?

Do you quote and sell to large tank car consumers the "going tank car market prices", or the same prices and terms that you quote and sell to oil jobbers?

If the open spot tank car market has become a market to all comers, regardless of their disposition of the gasoline, then would not we be entirely justified in including in our open spot market prices those asked of, and paid by, consumers, as well as by jobbers?

For all these years OILGRAM has been showing prices to jobbers separately from all others because they have been a class by themselves but if the oil companies, including the major companies, are now selling more and more to all who will buy in tank cars at those prices and on those terms, then it would seem only necessary for us to include all those quotations and sales.

Also I hear that there are sales to consumers of BRANDED gasoline. If so we are wondering if it would be of value to the industry for us to print the refiner's quotations on his BRANDS as well as on his UNBRANDED gasolines?

We could show a composite price, or the high and the low, in a given tank car market under the heading of "BRANDED GASOLINE.....c per gal."

The open spot market transactions in all petroleum products in all refining districts have been getting fewer for many years, until now there are many days when, for many products, no open market spot sales are reported by the refiners but only their quotations. Hence the prices that the price reporting mediums now give are made up partly or sometimes entirely of quotations rather than sales. This raises the question of the desirability of OILGRAM giving still more attention to gathering and printing quotations? Also it raises the question whether the industry would want the names of those quoting as well as the prices, particularly the high and the low?

Of growing importance is trucking. We have recognized prices for deliveries to trucks. Are there any that we have missed?

New Basing Points

With the great bulk of the country's gasoline, even in the Middle West, coming from other points than Group 3, Okla., is there any tendency to move to other points or to establish new basing points in sales?

If so what new points?

Are there any quotations or sales made based on the general Chicago refining district? Do you anticipate any in the near future?

Is there a tendency to make prices F.O.B. the terminal of the main gasoline pipelines? Do you think that will come about?

I am sending a copy of this letter to every OILGRAM subscriber with an appropriate letter asking his advice and information, and I am also printing these letters in full in NATIONAL PETROLEUM NEWS and calling on all in the trade, jobbers, refiners, brokers and all else, to give us their best advice.

It would be most helpful if you would discuss the above subjects rather fully that we may have the benefit of all your ideas.

Survey The Use Of Credit Cards

ST. LOUIS, April 4. — More than 50 companies have responded to a national survey on the use of credit cards by oil firms, E. Ray Siler of St. Louis, credit department of the Socony-Vacuum Oil Co., Inc., announced today.

The survey was authorized at the annual conference of the Petrolum Refiners Division, National Assn. of Credit Men.

Included in a questionnaire sent the oil companies are questions covering area involved, term of the card, products covered, control methods, investigations policies, costs of various kinds, delinquents, bad debt losses, bookkeeping methods and various mechanics of business solicitation and record keeping.

Roy Colliton of St. Louis, interchange report manager of the National Assn. of Credit Men, is compiling the data.

The information gathered in this first complete survey covering oil credit cards will be given to each participating company, Siler said.

NPA Cleveland Meeting Dates Are Changed

WASHINGTON, April 4.—Because Friday, April 15, is Good Friday, National Petroleum Assn. has changed the dates for its semi-annual meeting in Cleveland from Thursday and Friday, April 14 and 15, to Wednesday and Thursday, April 13 and 14.

Only change in the program will be the shifting of the discussions originally scheduled for Friday back to Wednesday, with Thursday's program remaining as scheduled (N.P.N. March 30, p. 15).

Virginia Oil Men To Meet

RICHMOND, Va., April 4.—The Virginia Oil Men's Assn. will hold its spring convention at the John Marshall Hotel here May 20, it was announced today by A. L. Tenser, secretary. Plans for the programs are being completed and will be announced soon.

Hearing Postponed

MILWAUKEE, April 4.—The hearing by the Wisconsin department of markets for April 5, to consider amendments to the gasoline price posting order, has been postponed until April 6, as April 5 is election day.

Disclaim Evidence Of Attendance Of Two at 'Conspiracy' Meeting

Minutes Show Dawes, Seubert Not At P&C Meeting

By E. L. BARRINGER

MADISON, April 4.—Oral arguments on dismissal motions were completed April 1 in the Madison oil conspiracy case and Judge Patrick T. Stone now has under advisement the question whether the jury's verdict of Jan. 22 convicting 30 individuals and 16 corporations of conspiracy squares with the evidence.

As to the position of the district court on the verdict, Frederick Wood, Sinclair Refining Co. counsel, argued the trial judge may set aside a verdict which is against the weight of the evidence, as his understanding of the law laid down by the circuit court of appeals for this district.

That the evidence presented the jury did not prove knowledge of an illegal conspiracy, or performance of an act through participation or authorization in a conspiracy was argued by defense counsel after defendant and governmental counsel had stated their arguments or motions to dismiss four oil company presidents.

The government's contention of knowledge on the part of Edward G. Seubert, president of the Standard Oil Co. of Indiana, and Henry M. Dawes, president of Pure Oil Co., through a Planning and Co-ordination Committee meeting Jan. 8-9, 1935, in Washington, was challenged by information given the court that both members did not attend the meeting.

Government counsel had argued that C. E. Arnott, chairman of the P. and C. marketing sub-committee, appeared at this meeting and gave a report on appointment of a committee to study tank car market stabilization at a meeting Jan. 4 in Chicago, and that Seubert and Dawes were present.

Were Not Present

Charles I. Francis, Pure Oil counsel, offered the court a certified copy of the P. and C. Committee meeting minutes, showing Dawes and Seubert did not attend. Weymouth Kirkland, Indiana Standard counsel, said Seubert was in Chicago at the time and Dawes was in Bermuda.

Government counsel objected to the minutes, as offering new evidence after the trial was ended. Francis said if objection was continued he would move for a new trial for Dawes on the ground of new evidence.

"What I want is the truth," said the court. "If the facts are this man was not there, let the record show it."

Take Eight Sessions

Arguments on the motions to set aside the verdict took up eight court sessions, beginning March 28, and added 782 pages to the previous 12,046 pages in the record.

Evidence against the four company presidents, set out in the government brief as implicated through evidence "more largely circumstantial" was heard on March 28 and 29 They are Jacob France, Mid-Continent Petroleum Corp.; Dan Moran, Continental Oil Co.; and Seubert and Dawes.

Government argument, and the replies were given March 30. Then counsel for the remaining defendants argued their cases March 31 and April 1. The government then submitted the case without further argument. The court announced counsel may file supplement briefs.

The first government rebuttal argument March 30 by W. P. Crawford special prosecutor for the government, charged defense argument had been "perfectly stock stuff" and the appeals are "largely emotional and personal."

Comment from defense counsel about statements at the Jackson senate hearing on the "friendly" Madison court being a "base slander" comes at a late date, Crawford said, and "with very poor grace."

On the defense argument about jury deliberations Crawford said, "If a fair trial was not possible in the situation that arose here during the trial of this case, then a fair trial is never possible in a case of this kind."

Government Gives Rebuttal

In view of the rising tank car market in early 1935 and the steady market after June, Crawford argued that the government always claimed that there was enough evidence for the jury to properly conclude "that these men in charge of the affairs of these four companies (Seubert, Moran, Dawes and France) lent their aid, comfort, support and were active participants in the operation of that conspiracy."

Government rebuttal was concluded by John Henry Lewin, on the government staff which conducted the trial. The inquiry before the court, Lewin argued, is not whether the defendants are guilty or innocent but "whether there is any substantial evidence fairly tending to sustain the verdict."

At the suggestion of the court Lewin took up the evidence to support the verdict against Seubert and the three other company presidents.

Lewin argued the defense had introduced testimony that Arnott told the Planning and Co-ordination Committee about the tank car stabilization committee appointment.

The conspiracy was launched at a Chicago meeting on Jan. 4, 1935, he argued, and Arnott appeared at the Jan. 8-9 P. and C. committee meeting.

Lewin Cites Circumstances

"Oh my goodness," Lewin argued. "Talk about circumstances. They just cry to Heaven. Here are Seubert and Dawes sitting in Washington; Arnott coming before them for the purpose of getting their consent and approval to this very self-same scheme."

Lewin argued that if the court believes "this scheme was innocent" then Arnott "related something innocent. But if your honor believes that the scheme was to rig the prices against the Sherman act, which I take it is the starting point of my argument, then what Arnott told Seubert and Dawes was this scheme, which is illegal."

The defense offered the P. and C.-Arnott testimony, Lewin argued, "because their counsel thought that they could persuade you and the jury to believe that, having explained all that to Seubert and Dawes in their capacity as members of this P. and C. Committeee, that gave the scheme some kind of government approval."

Attendance of Seubert and Dawes at this Jan. 8-9 P. and C. Committee meeting was denied the following day by Francis offering the court a certified copy of the minutes.

Another link with the P. and C. Committee, Lewin argued, was the defense testimony that McDowell and Jacobi were compensated for their stabilization expenses by the committee.

In addition to the P. and C. committee testimony, Lewin argued, there was publicity in the newspapers and "the fact that it was in the newspapers might not have been any notice to me or to you, if you weren't interested in oil. But what can be the point in putting in evidence of notoriety, unless it is notoriety to just such men as Moran?"

Buying Was Reported

On the point of knowledge through publications the court said there is evidence that buying was reported in journals, such as *Platt's Oilgram* "but I am not now going so far as to say that they knew or had knowledge of the illegal purposes."

Lewin argued he thought knowledge and participation in a conspiracy was established in the evidence "and when you consider how long they participated, then I say it follows as night follows day that Moran, and Seubert and Dawes and France were the people who, within the meaning of the Clayton act, authorized it."

On the evidence against France he said "My goodness, if there ever was a strong case, that is it." Lewin argued France was active head of the Mid-Continent Petroleum Corp. and that R. W. McDowell, vice-president, along with Arnott was the most active man in the conspiracy.

"Now, are reasonable men to be denied the right to infer that Jacob France, occupying that position, could have gone along for two years without having anything to do whatever with this matter, which McDowell was into up to his neck?" asked Lewin.

In arguing about Indiana Standard's buying from Waggoner Refining Co. and testimony by David Gray, then Waggoner sales manager, Lewin said "the greatest fiasco we witnessed in this entire case was the testimony from Dave Gray."

Authorization Presumed

Weymouth Kirkland, Indiana Standard counsel, took up the argument, charging that the government was taking the position "that they must presume authorization from knowledge and lack of action."

J. C. Denton, for Mid-Con-

Chides Time of Jury Deliberations

tinent Petroleum Corp., argued that the evidence showed McDowell did the buying on authority of the board of directors and from the company by-laws. There is no evidence, he charged, that France authorized or directed or did any buying. As the evidence showed the company did not buy more gasoline than needed, "the presumption of innocence there must be that McDowell bought the gasoline only that the company needed," he said.

Francis waived his right to reply to government argument on Pure Oil defendants as other defendants were to be heard, and Dan Moody, ex-governor of Texas, replied for Continental defendants.

"Mr. Lewin contends that knowledge may be inferred from the fact that these gentlemen are officers in the corporation; and then, from the inference of knowledge, that it may be inferred, that the ultimate fact to be proved may be inferred, that is, that they actively participated; that they did something, or that they authorized something in connection with the offense," Moody said for Moran and Harry Kennedy, Continental vice-president.

Argument For Shell

Moody's reply to government argument ended the court session March 30. Argument for other defendants was given March 31 and April 1, starting with Sam Mitchell, for Shell Petroleum Corp. defendants.

Oral testimony on Alexander Fraser, Shell president, Mitchell argued, was about his being a president active in the company's affairs and that Arnott had never talked to Fraser. Among the documents, Mitchell continued, "there is not a single one that was written by Mr. Fraser, and there is not a single document in this record that mentions Mr. Fraser," he argued.

The record shows office memoranda and price reviews were addressed to Fraser, he argued. The price reviews edited by the company, Mitchell said, were a digest of scout reports, trade publication news, and news heard in the trade. On office memoranda Mitchell argued only five were addressed to Fraser, and all were written prior to Feb. 11, 1935, the meeting at which he claimed government counsel charged "something was formalized."

Mitchell said Fraser did not have knowledge of an illegal conspiracy. Mitchell said Fraser did not attend a meeting, was not on any committee, did not write a letter, did not have a conversation and "he didn't do a single act which could possibly be construed as participating in an illegal buying program, even if he knew there was one, which I must submit he did not."

For P. E. Lakin, Shell vice-president, Mitchell argued the testimony showed attendance at two meetings. Lakin was at the Jan. 4 Chicago meeting, a code meeting, Mitchell argued and the record does not show any statement by Lakin. At the St. Louis meeting March 5 Lakin learned of a buying program, he argued, and the record shows the program was not compulsory, that there was not to be pool buying, that no price was to be agreed on, and that buyers were to make no commitments on price, quantity or specifications.

The record shows Lakin March 5 said his company was interested in buying from Cushing Refining & Gasoline Co., Mitchell argued. He told the court Shell is a continuous buyer, and that "the record shows Shell made a substantial freight savings on gasoline from Cushing."

Mitchell argued that Walter P. Jacobi, Tulsa buyer for Socony-Vacuum, did call Lakin and give a price but that Lakin did not follow the price recommendation.

"Mr. Lakin knew about a buying program, but nothing is in this record that he knew it was illegal," Mitchell said, and "he thought, of course, that he was engaged in a code activity, whether he was or not."

The Men Without a Company

B. M. Webster argued for Tide Water defendants. As it was impossible to argue each individual defendant's case to the jury "It is unrealistic to think that that jury ever had an opportunity to consider this case in terms of particular individuals," he said.

Another reality, he said, was that his clients, Noel Robinson, E. L. Shea and J. W. Warner, were the only defendants remaining in the case not associated with a defendant corporation, as the government had moved for dismissal of the Tide Water Associated Oil Co.

The only testimony about Shea, he argued, was given by Harold Parsons, assistant to Shea. Purchases in East Texas were made by Tide Water of Oklahoma, a company not mentioned in the indictment, and not by Tide Water of New Jersey, Webster argued. Shea was president of the Tide Water of New Jersey in the indictment period, the record shows.

The only evidence on participation in a conspiracy, Webster argued, was on purchases made by the New Jersey company through the Oklahoma company with the approval of Shea which he said "is absolutely a neutral circumstance."

For Noel Robinson, vice-president of Tidewater of New Jersey, a company that was dissolved, and dismissed from the case prior to trial, Webster argued, the only evidence was by Neil Buckley, East Texas buyer, on a meeting in Washington. Webster said Buckley testified to being hazy about remembering Robinson at a Washington or a New York meeting in the spring of 1935.

Webster took up testimony by Buckley about a conversation with Robinson in May, 1935, in which Buckley stated that Robinson was enthusiastic apparently about Buckley's work in East Texas. Robinson had good reasons to be enthusiastic, Webster told the court, as Tide Water had been a consistent buyer in East Texas for many years, but purchases had decreased each year as Tidewater's Bayonne refinery capacity gradually increased.

Warner was vice-president of the Tidewater of Oklahoma, Webster told the court, employed by a company never indicted.

"Warner simply carried out, through the Oklahoma company, an order received from the office of the parent company in New York. Now, that is the extent of his connections with the actual purchases in this case," said Webster.

No Tidewater company ever purchased more gasoline than was needed, nor at high, or agreed prices, and all were at the low or below of the Oilgram, he told the court.

Webster told the court Tidewater does business almost exclusively through midwestern jobbers, and of 400 jobber accounts the government only put one Tidewater jobber on the stand "and that one had nothing to say against the company with whom he had done business."

The evidence against W. G. Skelly, president of the Skelly Oil Co., then was argued by W. P. Z. German.

Skelly attended only one meeting, he argued, a general stabilization meeting Jan. 4, 1935, in Chicago and the record does not show Skelly said anything, he stated. For the company he argued there was no one on any committees, the P. and C., marketing or tank car stabilization. Also, that the company had been buying gasoline since 1931.

The government's brief, German charged, was inconsistent. Surplus gasoline was first discussed at the Jan. 4 meeting (attended by Skelly) the brief first charges, and then later sets the Feb. 5 meeting as the date of the first discussion on surplus, German told the court.

Knowledge of a conspiracy cannot be attributed to Skelly through the Jan. 4 meeting, he argued, as no one then knew the results of the committee appointed to study the independent refiners' condition. Also, the committee was appointed by Arnott as a result of suggestion from the floor, not as a result of a motion.

Argument for Phillips

Rayburn L. Foster argued Frank Phillips, president of the Phillips Petroleum Co., was in the unique position of being the only company president that was talked to by Arnott. Arnott testified, Foster told the court, to talking with Phillips sometime in 1935 about there being distress gasoline, knowing that Phillips was a buyer and that it would be fine if Phillips took distress gasoline into consideration in buying.

"Not a word is said as to what if anything Mr. Phillips replied," said Foster. As there is no documentary evidence against Phillips the government, he said, must be relying on Arnott's testimony.

The Arnott-Phillips conversation took place before Feb. 11, 1935, Foster argued, before the government contends the buying program "was formalized," at a time when no buying program had been arranged "and therefore the subject could not have been the buying program involved in this case."

There is no evidence that Phillips participated in the buying program in this case, Foster argued. The marketing department purchased gasoline, he said, with A. M. Hughes performing the duties after H. A. Trower, vice-president was in-

Judge Stone Weighs Trial Evidence

jured in 1934. Hughes was appointed a member of the tank car stabilization committee Jan. 4, attended the Feb. 11 meeting, and Hughes with H. A. Gardner, Phillips sales manager, attended meetings where distress gasoline was surveyed, Foster said.

"It cannot be denied that Mr. A. M. Hughes was an active participant in the buying program," he said. "It is quite clear, I think, that whatever was done by Phillips Petroleum Co. was done, immediately and primarily at least, through Mr. Hughes."

Hughes did not have knowledge of the unlawful purposes of a conspiracy, if it was unlawful, Foster argued. Hughes was not a vice-president, he continued, but stepped into Trower's place after Trower was injured in an accident.

"There is nothing to show that Mr. Hughes reported to Mr. Phillips or acted under his directions," Foster told the court.

Arnott's Work Praised

Arnott's stabilization work was praised by Charles E. Gately, arguing for Cities Service defendants. "I think he did a magnificent job in Washington and if I had anything to say about it, he would have a medal of honor instead of an indictment and a conviction, and I mean that," he said.

Harry D. Frueauff, vice-president of the defendant Empire Oil & Refining Co., attended a New York meeting in the spring of 1935 but the record is ambiguous as to what meeting, Gately argued, just showing that he attended.

Most serious evidence, Gately said, against Freuauff is two letters. One was to H. E. Brandli, March 21, 1935, asking for data on purchases "in order for us to determine the overall company's participation in the general buying movement."

Gately said the letter was in line with Freuauff's duties of collecting information, and even if his company was participating in a buying program Freuauff had not recommended anything or passed on any information to his superior, Frank R. Coates, he said.

The other letter, Gately said, was on April 11, 1935, to Coates listing East Texas purchases "in connection with the present buying movement." Everyone was using the term "buying movement" in 1934 and 1935, Gately said, "and it didn't mean anything, except that companies were purchasing gasoline in East Texas."

For O. J. Tuttle, of Empire, Gately argued he was asked by the late Pat Miskell to attend the tank car stabilization committee meetings, and the first evidence is of attending the March 5 St. Louis meeting. There is no evidence Tuttle ever recommended or suggested a price and "we claim that there is no guilty knowledge or knowledge of anything illegal that ever was brought to Mr. Tuttle's attention," said Gately.

Testimony shows Tuttle's company bought 756 tank cars of gasoline, Gately argued. The reason purchases were from Olney Oil & Refining Co., Olney, Texas, was that Empire's Gainesville refinery was shut down and the company bought in nearby Olney.

Gately then took up the telegram of Feb. 1, 1935 from H. E. Brandli, Cities Service Export Oil Co. vice-president, to Buckley about Buckley aiding the East Texas Refiners Assn. and several letters from Buckley to Brandli about going with the association.

Argument for Brandli

Brandli knew he could not deal in "hot" oil, said Gately in explaining Buckley going to the East Texas association, and that the export business is highly competitive. Other individuals could deal in "hot" oil, ship it to the Gulf, and this low price oil would compete in foreign trade, Gately explained. Brandli had "just as big an interest in seeing 'hot' oil cleaned up in East Texas as any domestic marketer had," said Gately.

"Now, our position on Mr. Brandli is this: that there are only two things in this case against him," Gately said. "One is that telegram—and that telegram is perfectly innocent, and there can't be any semblance of guilt connected with it, in view of the circumstances under which it was sent.

"And in the second place, the purchases that he made; which were all below the low, and he had no interest in this Indiana territory, and no connection with it at all. He had to buy gasoline, because the evidence showed that he neither had any manufacturing, any transportation or any production; he was just an export company."

The only government witness mentioning Bryan S. Reid, Chicago division manager of Socony-Vacuum Oil Co., was Jacobi, to whom Jacobi sent a copy of a weekly market letter and there is no evidence that the letter actually came to Reid's attention, argued L. M. Treadwell.

For C. L. Jones, former Socony vice-president and no longer in the oil industry, Treadwell argued;

"The defendant, Jones, being vice-president in charge of midwestern operations, authorized that company to participate in a purely voluntary buying program involving no pool or commitment, under which a committee would make current surveys of distress gasoline and put sellers having distress in touch with regular buyers so that the distress gasoline could be bought up at no more than the market price.

"That is the case against Jones. And if that is what Jones did, then under your honor's charge he did no wrong." Jones was mentioned in Arnott's testimony, Treadwell said.

Ashton's Position Cited

For H. T. Ashton, Lubrite division of Socony, Treadwell reviewed the references in testimony by Jacobi and McDowell regarding the type of buying program outlined at the meetings in the spring of 1935.

"If the plan which Mr. Ashton suggested and advocated was limited to the plan which Jacobi and McDowell said he suggested and advocated, then under the court's charge he should not be found guilty," said Treadwell.

Jacobi's testimony was the most vital to Ashton, Treadwell contended, and if the jury believed Jacobi's testimony that Ashton advocated no commitments, no definite quantities to be purchased, no price program and if the jury believed Jacobi's testimony that Ashton had no participation in activities of the sub-committee with reference to recommending price, then the jury should have acquitted Ashton.

"It follows then that the government could succeed in convicting Ashton only by convincing the jury that Jacobi was not telling the truth in these respects," he said.

Changed Position, Charged

Goldthwaite Dorr, arguing for Arnott, reviewed the economic condition of the industry leading up to 1935, and the changed position of government counsel on trade publications. He briefed the indictment charging trade publications published defendants' prices as jobber prices, then reviewed the jury argument of Hammond E. Chaffetz, of government counsel, about trade publications publishing jobber prices but defendant major companies buying the surplus under that price.

"Now, that rather changes the character of the whole case," Dorr charged.

At No Meetings

E. B. Reeser was indicted as president of the Barnsdall Refining Corp., and this company was not in operation until June 1, 1935, argued W. D. Loucks. Loucks said he had a right to rely on the June 1 date and that the corporation, or any representative, never attended a meeting, wrote a letter, sent a telegram, received a telegram on the buying situation, or engaged in a telephone conversation.

The indictment charged the refining corporation was an original conspirator, he claimed.

"Reeser was one of those members of the P. and C. Committee who was praised by the written communication from Secretary Ickes for the wonderful work he had done for the government—then, a few minutes afterwards, was indicted by the department of justice for the same work," said Loucks.

Ralph Horween argued for the three Globe Oil & Refining Cos., reviewing gasoline purchases, and the general economic condition of the independent refiners into 1935.

Proof was offered, Horween

Original Conspiracy Indictment Dropped

MADISON, April 4.—The original indictment in the tank car conspiracy case was dismissed in federal court here last week on motion of government counsel.

The motion applied to the 70 defendants who have been brought to trial or dismissed from the case, not to 12 defendants not brought to trial.

This indictment was returned by the grand jury that sat May 4, 1936. Defense counsel attacked the indictment charging the grand jury had not been selected according to law. Another grand jury was impaneled and returned a similar indictment which was tried last winter.

Another government motion continued impounding the documents called for by the grand jury. The documents will be available to defense counsel.

The same grand jury returned the second indictment, charging a conspiracy on jobber contracts, which has not yet come to trial.

argued, that I. A. O'Shaughnessey, president of Globe, reduced Oklahoma crude in 1934 to 65 cents "which he figured was the price which he would have to pay for crude oil in order to break even on the gasoline which was selling at the prevailing prices." Then O'Shaughnessey was prevailed on by the government to return to $1 crude. This offer of proof was excluded, Horween said, at a time when he believed the court did not realize its significance.

With the direct testimony as to the buying program proposed, the buying of the Globe companies, and the fact of O'Shaughnessey being on the tank car stabilization committee as a representative of independent refiners Horween said he was "unable to find any evidence which could convince a reasonable jury" that there was a price-fixing conspiracy and that O'Shaughnessey or the Globe companies participated.

A. V. Bourque, secretary of the Western Petroleum Refiners Assn., is the only defendant now in the case not connected with an oil company, Horween argued, and does not buy or sell oil.

At the request of the tank car stabilization committee he prepared a survey of distress gasoline in the Mid-Continent area, Horween said, and was requested to bring the survey to the Chicago Feb. 5 meeting. He took the survey to the Feb. 11 Chicago meeting, but did not attend the St. Louis March 5 meeting, Horween said.

"Now, if there was a conspiracy, it could not possibly have been hatched until the meeting of March 5," Horween said. "Mr. Bourque was not there. The government's theory, apparently, is that somebody made improper use of these figures that he gave them."

Argument for Carnes

The final argument was given by Wood for J. W. Carnes, Sinclair Refining Co. vice-president. Wood pointed out that acts or declarations by other officers, or employes of Sinclair may not be considered in determining whether there is sufficient evidence to sustain the verdict against Carnes.

The evidence shows Carnes did nothing at any of the meetings in which the Mid-Continent buying program was discussed, Wood said, because he attended none. Also Carnes said nothing to anyone outside the Sinclair organization about a Mid-Continent buying program. And as for intercompany statements the evidence shows five telegrams to Tracey, Sinclair buyer at Fort Worth, Texas.

In three telegrams to Tracey there was authorization from Carnes to buy 165 tank cars of gasoline in the Mid-Continent field, out of 6200 cars bought by Tracey during the indictment period, Wood said. Carnes also authorized buying 25 cars from Panhandle Refining Co., named in the indictment as Sinclair's "dancing partner," but Wood said at the same time Carnes authorized buying 50 cars from the Omar Refining Co., a non-"dancing partner."

There is no evidence that Carnes knew of the "dancing partner" arrangement, Wood told the court. There also is no evidence Tracey bought any differently as to suppliers or price.

Taking up the Sus memorandum of the Feb. 11 Chicago meeting, Wood argued there is no evidence that Carnes ever saw the memorandum and that Sus did not testify as to whom in the company the memorandum was sent.

No Agreement Made

Wood then took up the evidence on the East Texas situation. Carnes was present at all meetings at which Buckley told of the plight of East Texas refiners, he said, but there is no evidence that any agreement, express or implied, was ever reached at any of the meetings.

The record shows, Wood continued, that Buckley on March 20, 1935, asked Carnes if he was willing to buy gasoline through the East Texas Refiners Assn. and Carnes said that was up to Tracey. That was neither an order nor an authorization, Wood contended. Of the 15 or 16 telegrams from Sinclair on the East Texas field there is only one in which Carnes authorized Tracey to buy gasoline, Wood continued. That was for 25 cars, without reference to price, for use at Houston.

About telegrams from Tracey to Carnes on buying by other companies Wood said "the first significant thing about those telegrams is that not a single one was answered by Carnes."

The connecting link in the indictment between an East Texas buying program and prices in Wisconsin, Wood pointed out, was that jobber contracts are based on the averages of trade journal prices. Sinclair bases all its jobber contracts on Sinclair's own posted tank car price, he said, hence Sinclair and Carnes are distinguished on this point from all other companies in the case, he said.

After Wood's argument the government submitted the case to the court without further argument.

Train Bill Killed

WASHINGTON, April 4.—After holding almost three months of hearings, the House Interstate Commerce Committee voted last week to kill the bill (S. 69) which would have limited freight train lengths to 70 cars. The vote was 14 to 7 against favorably reporting the measure, which had been condemned by railways and shippers alike. Its chief supporters were labor organizations. The bill had been passed by the Senate.

Indiana Standard Seeks Rate Slash

N. P. N. News Bureau

WASHINGTON, April 4.—Hearings will be held before an Interstate Commerce Commission examiner in Chicago, beginning May 6, on the plea of Standard Oil Co. of Indiana for lower rates on petroleum products from its Greybull, Wyo., refinery to points in the Dakotas and Minnesota.

Standard's plea hinges on the new lower rates granted by the ICC in December for shipments from Laurel and Billings, Mont., to these destinations.

Before this decrease was allowed, its complaint sets forth, rates from the Greybull refinery to many of the destination points were identical with those from Laurel and Billings. The December order authorized slashes in rates for Montana products up to 23.5 cents per hundredweight.

The Montana refiners (the case was brought by Independent Refining Co., and Yale Oil Co.) pointed out in their case that rates from Mid-Continent and other shipping points equidistant, and in some cases farther from the destinations than the Montana refineries, were lower.

Now Standard of Indiana, in its case, points out that Greybull is equidistant, and in some cases nearer, to some of the destinations, but is paying a higher rate than the Montana refiners, because of the rate cut.

The complaint attacks the rates from Greybull to the Dakota and Minnesota destinations as "unjust, unreasonable and unduly prejudicial," and asks for a reduction in the rate as well as for reparations for alleged over-charges in the past, the inference being that if the rates from the Montana refineries were unreasonable enough to warrant their reduction, then those from Greybull must have been so all along.

U. S. Claims Elk Hills '16'

N. P. N. News Bureau

WASHINGTON, April 4. — General Land Office has issued a formal ruling declaring Section 16 in the Elk Hills oil field, Kern County, Cal., is government property, was "known to be mineral in character" prior to January 26, 1903, and therefore is not subject to private ownership and development.

The decision is in line with a ruling previously made by Interior Secretary Ickes in the "Section 36" case, which was upheld by the federal district court for Southern California in February.

The latest ruling denies ownership claims to the property filed by the State of California, General Petroleum Co. of California, Thomas A. O'Donnell, Homer I. Tupman, and the Potter Oil Co., all of whom have 30 days in which to file an appeal to the interior secretary.

Decision in the "Section 36" case now is in process of appeal to the circuit court of appeals by Standard Oil of California and other defendants. In that case, Judge L. R. Yankwich held that title to the land remained in the government and ordered Standard of California to pay court costs and damages amounting to $6,214,102.42.

Both cases arose out of a U. S. law passed in March, 1853, granting Sections 16 and 36 in every township of public lands in California to the state for school purposes. Courts subsequently construed this law as amenable to the government's general mineral land exclusion policies.

Private companies bought up portions of these school sections after oil development began in the Elk Hills territory, and in the current cases, Standard of California, which had acquired some of the land, claimed title on the ground that the property had not been recognized as mineral in character at the time the approval of the survey of the lands was given by the General Land Office in 1903, it was said.

Burner Shipments

WASHINGTON, April 4.—Shipments of distillate oil burners by American manufacturers in February numbered 5199 units, compared with 6786 in January, 8746 in February 1937, and 6370 in February 1936, Census Bureau reports. The types of burners included in the statistics are those used in ranges, stoves, water heaters, and space heaters.

Major Purchaser Reducing Crude Oil Buying 20%

N. P. N. News Bureau

TULSA, April 4.—A 20 per cent reduction in the amount of crude oil purchased in Oklahoma and Kansas on and after April 10 has been announced by the Carter Oil Co., subsidiary of the Standard Oil Co. of New Jersey, one of the major purchasers in the two states. The reduction will be calculated on the basis of daily average purchases of February and March.

Announcement of the reduction was made by J. J. Conry, president of the Carter company April 1, only a short time after the Oklahoma Corporation Commission had issued its April crude oil production allowable.

The commission set the total allowable for the state at 475,000 barrels daily, the same total carried in the March order, during which month an estimated 25,000 barrels daily was overproduced. The commission in its April order, however, readjusted some fields in an effort to prevent a recurrence of this sizable overproduction.

Urged Lower Figure

The Carter company's action was in line with the recommendations it made at the operators' meeting in Oklahoma City prior to the hearing March 31 before the commission. At that meeting, and again before the Commission, Carter's representatives recommended an allowable of 425,000 barrels daily for April in Oklahoma, contending that was nearer the actual market demand than was the 526,500 barrels estimate by the Bureau of Mines.

The Stanolind Crude Oil Purchasing Co. recommended 450,000 barrels daily for April, but said the 475,000 barrels daily average figure urged by other operators would be acceptable provided operators did not exceed the allowable, as they had in March. Two other buyers supported the Stanolind recommendation, but the majority of the 17 buyers present at the hearing favored the daily average total finally set by the commission.

President Conry in his statement said that reductions will be made in all fields except Tussy and Wildcat Jim, in Carter county, and in fields where leases to which the company is connected average 10 barrels or less per day. At the same time the company is reducing runs from its own leases in the same proportion.

Conry's Statement

"It is a matter of general knowledge within the industry," President Conry said, "that, beginning last fall, our market outlet substantially was being reduced from month to month. This condition has grown so critical that now our market outlet is about 50 per cent of normal.

Fully appreciating the hardships that would be visited upon our customers by a substantial reduction in our takings, we . . . have made every effort to divert sufficient connections to other purchasers to enable us to take the Corporation Commission allowables from the remaining properties we serve. This effort failed. March 8, we reduced takings from four areas in southern Oklahoma, hoping that in the meanwhile there would be such improvement in conditions that a general reduction in our taking could be averted. That improvement has not materialized."

While other purchasers were studying the Carter's move, it was believed in most quarters that the condition is local with that company. Carter purchases through its subsidiary, the Oklahoma Pipe Line Co. It produces and purchases about 60,000 barrels of oil daily.

This enforced "pipeline proration" is the second for the Oklahoma fields since Jan. 1, although it has been in effect in some Kansas fields for several months. The Sinclair Prairie Oil Marketing Co., during January and February, reduced purchases 10 per cent in all fields but when the corporation commission reduced allowables the company resumed 100 per cent purchases in March.

Oklahoma City Unchanged

The Oklahoma Corporation Commission's April order, meanwhile, granted increases in four small fields, while quotas were unchanged in nine fields, with the remainder of the fields getting a flat 5.411 per cent reduction. The Oklahoma City field was left unchanged at 85,699 barrels daily, with the minimum allowable raised from 225 to 250 barrels per well, and the percentage raised from 8.5 to 10 per cent.

Operators in the KMA district of Archer and Wichita counties, north Texas, meanwhile, are reported facing a tightened situation with reference to pipelines. Several companies are reported to be turning down connections on new leases. Unless proration is tightened, it was said, pipeline proration may be established. Production was reported to be about 10,000 barrels in excess of allowable at the present time.

Major purchasers in Kansas announced, meanwhile, that pipeline proration would remain in effect in that state during April. Phillips Petroleum Co. announced it would take 75 per cent of the net allowable; Kanotex Refining Co. will take 85 per cent of the actual allowable; Stanolind Crude Oil Purchasing Co. will take 75 per cent of the current allowable, and Sinclair-Prairie Oil Marketing Co. will take 85 per cent of allowable in prorated areas and a line percentage of production in unprorated areas. The new percentages are reported to represent slight reductions in takings as compared with March purchases.

Shell Reduces Crude Takings 20 Per Cent

(Teletype Bulletin)

TULSA, April 5.—Shell Petroleum Corp., today announced it would reduce its crude takings in Oklahoma and New Mexico 20 per cent effective April 10. Reduced takings will be based on 80 per cent of daily average runs for each lease during March, or 80 per cent of "normal allowable state prorated production" for the current month, whichever is the lower.

In New Mexico, takings based on 80 per cent of the daily average runs during March are exclusive of production run in excess of normal during that month.

Further Curtailment Needed in California

N. P. N. News Bureau

LOS ANGELES, April 4.—Hitting the lowest point in the production curve for more than three months, California's output of oil on March 28 was 698,419 barrels, or only 4000 barrels above the U. S. Bureau of Mines recommendation for March. The actual quota set by California's voluntary proration authority was 650,000 barrels and this was estimated as above actual demand.

The Central Committee of California producers March 30 approved the U. S. Bureau of Mines April figure of 698,700 barrels, but said quotas for wells on production April 1 would be less than 655,000 barrels.

During March 133 new wells were completed in California with a combined initial potential capacity of 147,000 barrels daily. These wells will receive an aggregate quota of 17,869 barrels a day of the April allotment.

Continuation of extensive drilling in California, it was said, indicated the rate of new completions will not drop for several months. These completions will require some oil curtailment in certain fields where no proration has been asked during the past 18 months, because of the small output of wells heretofore.

Completion of six new wells in the Wilmington field since March 26 caused output from that area to reach 106,226 barrels on March 31, and raised the state output to 706,753 barrels.

Ask Report On E. Texas Wells

KILGORE, Texas, April 4.—The Texas Railroad Commission has called for a detailed report showing the current status of wells in the East Texas field incapable of making their allowables.

The order calls for name of operator, name of lease, well number and location, elevation, sand top, total depth, method of producing the well, current allowable, percentage of water and whether the well is now making its allowable.

The fact that the reports must be in the Kilgore office by April 15 indicated that the commission, at its regular monthly proration hearing set for April 18, will study further the suggestion made some time ago that the East Texas allowable could be lowered by weeding out wells which no longer can produce their allowable but which are used for "credit" purposes on lease production.

The density of East Texas wells has reached the ratio of one well to each 5.40 acres. The major companies have a density of 1 well to 6.10 acres, while the independents have a ratio of 1 well to 4.5 acres.

The Overton Refining Co. has asked the commission for permission to do town lot drilling in Kilgore, which already has over 200 wells within its city limits.

No. 2 For Petty

WASHINGTON, April 5.—A girl was born to Mr. and Mrs. A. M. Petty here today. Petty is a member of the NATIONAL PETROLEUM NEWS editorial staff. The Pettys also have another daughter, Barbara, aged four years.

Oklahoma Drops Vacuum Lift Ban

N. P. N. News Bureau

TULSA, April 3.—The Oklahoma Corporation Commission's ban on the use of vacuum lift for recovery of oil has been removed by the state supreme court, except where it can be proved the method creates waste.

The ruling of the commission was vacated by the court on an appeal by the Gilmer Oil Co. and Roy M. Johnson, operators in the Healdton field of Carter county. The court said that, while some witnesses had testified the method was improper, the theory was "unsupported by established facts."

"It is shown that the method has been employed in other fields over a period of 60 years with successful results from every known point of view," the court stated. "It has been used with success and without known injurious results in the Kiefer field, in Creek county. In the Healdton field the respondents have employed it over a period of 20 years and production has been maintained at a level seldom accomplished by any other means."

DAILY AVERAGE PRODUCTION IMPORTANT DISTRICTS

American Petroleum Inst. Figures

	Week Ended April 2 Barrels	Week Ended Mar. 26 Barrels
Oklahoma City	102,700	109,450
Total Okla.	491,850	504,800
East Texas	429,700	429,150
Total Texas	1,320,900	1,317,400
Rodessa	41,650	40,750
Total La.	262,450	260,700
California	704,500	724,500
E. of Rockies	2,662,750	2,681,100
Total U. S.	3,367,250	3,405,600
Crude imports	65,280	81,140
Tot. new sup'ly	3,432,530	3,486,740

Senate Votes $13,000,000 For War Against Syphilis

(*Continued from page* 17)

er publications destined for medical eyes only; no general-circulation newspaper would allow it in its columns, it was pointed out.

This finding by a Senate subcommittee reflects the concern aroused in the public by the recently - inaugurated syphilis campaign headed by the Public Health Service.

"There is a wide public demand for action," the report points out. "An impressive roll of national and state organizations devoted to medical, health and civic problems endorse the campaign.

"Newspapers and magazines without exception, and without dissent from any reader, have warred upon this disease which once was sealed in a tight taboo. Repeated samplings of the electorate by the American Institute of Public Opinion shows public understanding of various phases of venereal disease control, and shows public support which consistently exceeds a ratio of 10 to 1. No witness appeared in the well advertised and crowded subcommittee hearing to express opposition to the bill, either in policy or detail. No adverse communication was received.

Should it be enacted into law, the bill provides that the Surgeon General "after consultation with a conference of state and territorial health officers," shall make the regulations under which the act shall be administered.

Although no official statement could be educed from the Public Health Service as to the nature of these proposed regulations, attaches said unofficially that it was probable they would set sanitary and cleanliness standards, as well as scientific and medical ideals, with which states must comply in order to receive their share of the federal funds.

Gasoline Stocks 12 Million Barrels Above April of 1937

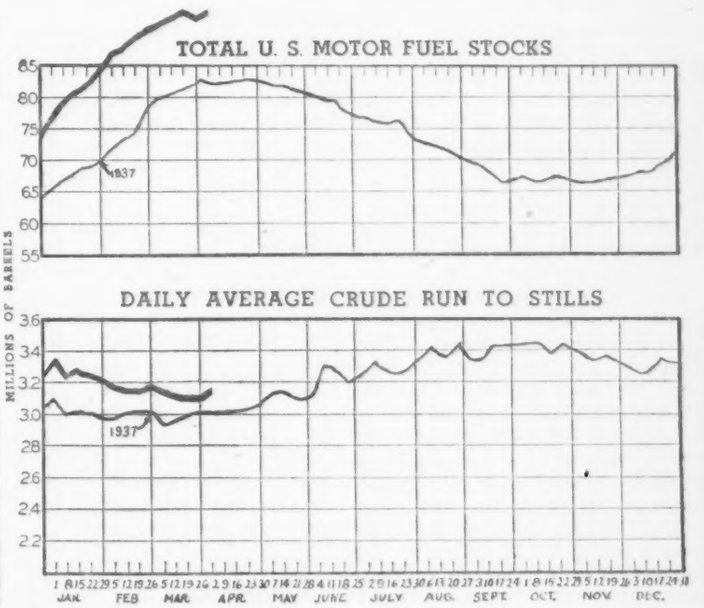
NEW YORK, April 5.—Gasoline stocks resumed their upward trend in the week ended April 2, the estimated total for the U. S. rising 66,000 barrels, the American Petroleum Institute's report of refinery operations today showed.

Crude runs to refinery stills for the country as a whole increased 69,000 barrels on daily average, and gas and fuel oil stocks rose 652,000 barrels.

Substantial cuts in gasoline stocks were made in the Oklahoma-Kansas-Missouri and Indiana-Illinois-Kentucky districts, but these were more than offset by sizable gains in a number of other districts. Louisiana-Gulf stocks increased 292,000 barrels. Estimated U. S. total stocks April 2 were 11,339,000 barrels above the April 2, 1937 total of 81,585,000 barrels.

The gasoline stocks increase the past week was entirely in refinery inventories where stocks of finished gasoline increased 227,000 barrels, and unfinished stocks, 201,000 barrels. In-transit and bulk terminal inventories were down 344,000 barrels.

Gas and fuel oil stocks increased in the majority of refinery districts. Notable exceptions were the Texas-Gulf and Louisiana-Gulf districts where inventories were down 344,000 barrels and 251,000 barrels, respectively. California stocks jumped 858,000 barrels, hitting 85,094,000 barrels on April 2.



CURRENT REFINERY OPERATIONS

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks Thousands of Barrels Total Finished and Unfinished Motor Fuel*		Total Finished and Unfinished Motor Fuel*		Gas & Fuel Oil		Cracked Gasoline Production % Total Capacity Reporting	Daily Av. Production (Barrels) Week Ended	
		April 2	Mar. 26	April 2	Mar. 26	April 2	Mar. 26	April 2	Mar. 26	April 2	Mar. 26		April 2	Mar. 26
East Coast	100.0	517,000	474,000	77.3	70.9	22,934	22,898	9,347	9,277	100.0	98,000	105,000		
Appalachian	88.4	103,000	95,000	79.8	73.6	3,551	3,575	1,291	1,261	94.6	29,000	24,000		
Ind., Ill., Ky.	92.4	409,000	397,000	83.6	81.2	15,394	15,552	7,158	7,020	98.5	128,000	121,000		
Okla., Kans., Mo.	84.7	261,000	272,000	68.1	71.0	7,893	8,122	3,432	3,442	90.3	62,000	70,000		
Inland Texas	56.6	128,000	136,000	63.7	67.7	2,678	2,561	1,584	1,495	71.7	38,000	38,000		
Texas Gulf	95.7	734,000	721,000	92.1	90.5	13,740	13,641	8,246	8,590	98.0	163,000	169,000		
La. Gulf	96.6	128,000	133,000	76.2	79.2	2,721	2,429	2,812	3,063	100.0	25,000	21,000		
No. La., Ark.	63.7	36,000	48,000	62.1	82.8	487	496	514	523	77.5	6,000	8,000		
Rocky Mt.	69.7	40,000	40,000	64.5	64.5	2,296	2,305	785	704	85.4	13,000	12,000		
California	90.9	512,000	483,000	68.6	64.7	16,270	16,319	85,952	85,094	98.0	57,000	58,000		
Total Reporting	89.0	2,868,000	2,799,000	77.5	75.6	87,964	87,898	121,121	120,169	94.8	619,000	626,000		
Estimated U. S. Total (Bur. of Mines Basis)		3,145,000	3,080,000			92,924	92,858	123,621	122,969		695,000	700,000		

*Includes stocks at refineries, in bulk terminals, pipe lines and in transit.

Pay-Locked Toilets Lessen Work Cut Cost, Build Customer Good Will

Dealers' Experiment Indicates Greater Use of Locks

N. P. N. News Bureau

CLEVELAND, April 4—If the experience of the few—very few—gasoline dealers in Cleveland bold enough to put pay locks on their washrooms is any indication, a lot of arm chair theory on locked service station restrooms is going to be exploded.

Why locks should *not* be put on service station restrooms can be reasoned out very logically. First, service stations are supposed to give services and one of these services is free wash room facilities. Secondly, it can be argued, customers will resent the locks, become angry and not buy gasoline or oil any more. Even one manufacturer of pay locks remarked to a NATIONAL PETROLEUM NEWS writer his belief that gasoline dealers are bad credit risks and that the volume, he thought, would be too small to bother collecting from a dealer, who would only try and dodge payment anyway.

But the only trouble with these theories was that all dealers here that could be found who were actually locking their rest rooms gave practical experience contradicting the theories. The theories, in short, were wrong, so far as practical experience here indicates.

This practical experience is very limited, for the idea of a locked restroom is yet handicapped by prejudice and indifference. Because such experience is limited, the value of the pay lock on service station restrooms is by no means fully demonstrated, and conclusions must be hedged with qualifications. But there is a technique of properly operating pay locks, a technique that should be tailored to fit each individual station, and the dealers here who have installed pay locks state they have three principal advantages:

Three Advantages

1. Pay locks lessen work and enable a higher standard of restroom cleanliness.
2. Pay locks are sources of revenue.
3. Pay locks are actually a means of building customer goodwill—if the attendant is tactful.

The first and third of these reasons for locking station restrooms are closely related and in the minds of the dealers interviewed were more important than derived revenue. Because of this fact it is worth while to get right down to fundamentals and ask: "How important is a clean restroom to service station customers, anyway?"

In answer to this, no guess work is necessary. As part of a comprehensive survey conducted in December, 1937, the Socony-Vacuum Oil Co., Inc., asked Mr. and Mrs. John Q. Motorist this question.

A total of 3359 persons were interviewed by an indpendent research corporation in 40 different localities in New York, New England states, Pennsylvania, Ohio and Michigan. Only car owners were interviewed, 81.1 per cent were men and 18.9 per cent were women.

What the Customer Wants

Socony was interested in a lot of other things, but on this particular topic it found that "Clean, attractive washrooms" were really wanted by 75.3 per cent of those interviewed. This meant, the survey revealed, that the customers wanted clean washrooms more than they wanted battery service, more than car washing, or spark plugs or brake service at service stations. In fact the only services listed ahead of clean, attractive washrooms were sale of anti-freeze, gasoline, oil and greasing service!

"We wanted to know how many different services and products people really want their service station to provide. So we listed 16 different services and products, and asked those we interviewed to check each one they *really* wanted," said Socony.

On the average, people checked 8.2 services (out of the 16) and products which they said they wanted. Following are the percentages of all those interviewed who checked each service or product:

1. Gasoline	91.8%
2. Oil	90.4
3. Greasing service	86.4
4. Anti-Freeze for sale	80.3
5. Clean, attractive wash rooms	75.3
6. Battery service	60.0
7. Car washing	51.4
8. Spark plugs for sale	39.5
9. Brake service	35.1
10. Upper cylinder lubricant	36.7
11. Tires for sale	31.0
12. Auto wax and polish	32.9
13. Batteries for sale	30.6
14. Cigarettes	21.9
15. Soft drinks and candies	15.8
16. Auto radios for sale	19.6

Then just to double check, the survey listed 10 free services and asked people to check the ones they wanted, and also to check the ones where they felt there was room for improvement.

Clean toilets were wanted by a greater percentage of customers than any other service, after the windshield was cleaned and the radiator filled, and a greater percentage said there was more room for improvement here than in the improvement of any other service. Following is the record:

Service	I Want It	Room for Improvement
1. Clean toilets (3)	74.8%	54.2%
2. Wipe rear wind.	69.5	44.2
3. Check tires	72.3	34.3
4. Check battery	46.1	32.0
5. Wipe windsh.(1)	89.9	25.0
6. Quick service	68.7	21.4
7. Fill radiator (2)	84.2	18.8
8. Free map serv.	50.8	14.5
9. C'rteous serv.(5)	73.1	14.4
10. Check oil...(4)	74.1	11.0

To achieve the standard of cleanliness, proved by the survey to be considered so important by gasoline station customers there is obviously but two methods of cleanliness improvement: (1) More work by station attendants and (2) restricted use of the washrooms.

Taking it for granted that every attendant is working his head off to keep the station clean, point number two offers the greater possibility for improvement.

"Red" Steele, a Socony-Vacuum lessee operating a station at E. 83rd Street and Carnegie Ave., Cleveland, does not have pay locks on his station, but he does keep the women's restroom locked.

Carnegie Avenue is a main boulevard feeding downtown from substantial and wealthy residential districts. It borders a negro district.

Steele said there were two reasons why the locked rest room for women is easier to keep clean than when he left it unlocked. First, it is used less frequently, by virtue of inaccessibility to neighborhood pedestrians. The wash room door is on the outside of the building, near the side street. Secondly, he remarked, "We find the women themselves keep it cleaner because they know that we would know who dirtied it up."

A metal sign 2.5 by 4 feet proclaiming CLEAN REST ROOMS stands on the street intersection corner of the service station lot. Women customers are watched by attendants and, if they start toward the rest room, which is entered from outside the station, they are promptly given keys. Occasionally, when busy, the attendants do not notice the customer, but even so only a part of the women seem embarrassed when asking the attendant for a key.

Both the men's and women's rest rooms are electrically lighted, have tiled walls to a height of four feet, and are equipped with hinged windows opening to the outside. Steam heat is also provided. Equipment includes a grated soap dispenser, mirror, waste basket, paper drinking cup dispenser, roller towels of cloth in a cabinet with mirror and toilet and wash bowl of vitreous china. In the women's rest room two roller towels are provided.

Costs $1.50 Per Week

During the summer the men's room, attendants at the station estimated, is used 100 times a day and the women's room 25 times. The cost of this amounts to $1.50 a week. Each of the three towels, changed once a week by the towel supply company, cost 45 cents. The balance of 20 cents covers cost of soap and toilet paper.

Despite this out-of-pocket expense, with which every station operator is familiar, Steele said he had never tried pay locks. He said he believed that the resentment would be too strong in his particular locality. But, he said, he had never seriously thought before of the possibility of installing pay locks and giving keys opening the locks to gasoline and oil customers.

The reason the women's wash room is locked, and the men's is not, he said, was because the attendants themselves were able to keep undesirable passersby from entering the station wash room. The men's door is inside the station, while the women's fronts on the side street.

The first thing each of the two attendants and the lessee himself do when reporting for work, unless customers are waiting on the driveways, is to clean the rest rooms. The three come on duty at different times of the day, so that each rest room is cleaned three times a day.

"Customers seldom compliment us about the cleanliness of the rest room alone," Steele said, "but they frequently remark about the appearance of the station as a whole. We hear many times the remark,

'This is the cleanest station I have ever been in.' "

To William F. Funke, independent Texaco dealer in Rocky River, a suburb of Cleveland, the problem of passersby who were not motorists abusing the privilege of his service wash rooms was particularly acute. Late last tourist season he placed nickel locks on both the men's and women's rest rooms and collected, he said, more than enough to pay his water bills. Besides, he found that the wash rooms were a lot easier to keep clean.

Funke, until March 14, 1938, when he sold out, was proprietor of The Owl, a service station located on Route 2, main highway for east-west traffic along the shore of Lake Erie. The station also carried a limited stock of groceries, candies and tobacco for the convenience of suburbanites living within a two-mile radius. Thus his patrons for gasoline and oils and for the facilities of the station consisted primarily of two groups—regular customers in the neighborhood, and transient tourist trade.

"There is not a station west of mine for seven miles," Mr. Funke explained, "so that eastbound traffic in particular called at my station. The use of the rest rooms became so heavy in the summer that it was a difficult task to keep the wash rooms clean and do all my other work at the same time. Therefore, I tried the locks."

The station proprietor and his employe each had a set of keys for the two nickel locks. Any regular neighborhood customers or any transients purchasing gasoline or oil at the station were watched by the attendants and given keys if they started toward the rest rooms. Transient motorists merely stopping for "free" services, however, paid to enter the wash rooms.

Took In $8 a Month

Funke took in $4 a month during each of the tourist season months from each of the two locks, he said, over and above the rental to the company which installed and owns the devices. This rental is a percentage of the take, the company's percentage decreasing as the total intake increases.[1] A meter on each lock tells the manufacturer's agent exactly how many nickels have been deposited in the lock. This $8 a month intake for the station was achieved despite the fact that only the Information-Wind-and-Water customers had to pay to use the toilet facilities.

Not one customer in 10 took exception to the five-cent charge, Funke said. In fact customers who commented remarked that they would rather pay five cents and feel it was exclusive than use a toilet that was open to hitch hikers and all. Still others, he said, preferred paying the charge to feeling obligated to the station when they were not making a gasoline purchase.

"Occasionally some of my friends living near here would kick about the nickel—in a half-kidding way," Funke said. "When I explained to them I was trying to keep a high standard of cleanliness, they were satisfied and saw my point of view."

Women usually carry their pocketbooks when they go to the rest room, the station proprietor said, because the purses contain the compacts, and so it was seldom necessary for a woman to return to the car for her purse. He said it was also seldom that customers were embarrassed by having to ask for change.

Cleanliness Expected

Naturally, Funke agreed, customers paying five cents for the use of the wash room facilities expected a high standard of cleanliness. This fact, he said, made the devices possible and gave the incentive to him and his employes to keep the toilets clean. However, the equipment in the station wash rooms was not elaborate. Only cold water was installed and the seat was not new. Paper towels and cake soap only were provided, but both of these items were always on hand. The washrooms contained mirrors and waste paper baskets. The concrete floors were not only swept, but mopped frequently.

A spring on the door closes it tightly, insuring the customer's privacy during use and that the door will not be thoughtlessly left open so that subsequent patrons will find the room accessible without toll to the lock.

E. G. Bark, a fellow Texaco

[1] The contract of one of the nickel lock companies provides for a split according to the following schedule:

N. P. N.'s Minimum Profit Standards For Nation's Service Stations

The following Minimum Profit Standards, for appearance and cleanliness of service stations the country over, are offered by NATIONAL PETROLEUM NEWS. They have been published in earlier issues in connection with articles and statements from various authorities to bring to the attention of the oil industry the fact that the public is becoming aroused against unclean toilets at stations as possibly unsafe toilets. As a result of this growing public education in toilet and rest room sanitation, an increasing proportion of gasoline gallonage this season will go to the stations which, by their outward appearance, show that their rest rooms and toilets are clean.

For Station Site . . .

No empty cans, rags, or rubbish on drive.

Curb and drive edges clean and whitewashed.

No wet or dried grease or oil spots on drive.

Floodlight reflectors clean, lights in good condition.

Pump island clean and whitewashed frequently.

No discarded cans, pails, or rags on pump island.

Pumps washed frequently.

Pump hose free from leaks and not frayed.

Pump globes and lights in good condition and clean.

Fence, wall, hedge, or garden in well kept condition.

Air hose picked up and in good working order.

Curb and street signs freshly painted and well lighted.

Fill box openings painted and free of dirt.

For Station Building (Interior) . . .

Walls, floors and ceiling clean, with no grease spots.

Office equipment well kept, with no loosely filed papers in evidence.

Manager's desk clean, with no milk bottles, coffee cups, newspapers, rags, lunches, or tools in evidence.

Conservative use of signs, cards, and wall charts.

Attendants' street clothing and miscellaneous stock kept out of sight in closet or storage room.

Pit or lift well cleaned after each job.

Lubritorium floor cleaned after each job.

Lubritorium walls, ceiling and floor well painted.

Stock of tires, batteries, and accessories neatly arranged and **Clean.**

Work bench cleaned off after each job and tools put in proper place.

Grease guns in proper place on clean rack when not in use.

High-boys with no oil spillage on top, front or sides.

Container for oily rags and rubbish freshly painted and with a lid or self-closing top.

Waste basket in office.

Comfortable and **Clean** chairs for customers.

Window displays that are timely and not piles of a mixture of winter and summer items.

All miscellaneous items, not necessary to the immediate job of serving customers, out of sight, including such items as brooms, mops, step ladders, and overalls.

Lamp bulbs in good condition and light fixtures clean.

Lubritorium and other service bay entrances unobstructed.

No odds and ends lying around, such as old second-hand tires, scrap parts, junk, or old batteries.

Compressor clean, and located where noise will not interfere with conversation with customers.

For Station Toilets and Wash Rooms . . .

All toilets in **Good Repair.**

Wash bowl fixtures in **Good Repair.**

Toilet and wash bowls **Spotlessly clean.**

Toilet seat freshly painted and clean.

Floors, walls and ceiling clean.

No litter in the rooms.

Do not use rest rooms to store **Anything.**

Rooms and fixtures inspected, **Frequently Each Day.**

Clean rest rooms at least **Once a Day.**

Supply soap and towels (paper towels at least).

Rooms should always **Smell Clean.**

For Station Building (Exterior) . . .

All unsightly and poorly painted signs eliminated.

Building surface free from splatters.

No chipped or broken exterior wall surfaces.

Roof in good condition.

All empty or unkept cans, barrels or boxes out of sight.

Windows clean.

For Personnel . . .

Uniforms and caps **Clean.**

Attendants clean-shaven.

No dirty rags in attendants' pockets.

dealer operating at 1392 Sloane Ave., toward the city about one mile from Funke, installed pay locks at his station after learning from Funke of his experiment.

Bark's locks have been installed too recently to indicate their earning power. The company, which took 80 per cent of the receipts in January and February, collected $2.32 and $1.44 in those months respectively. From experience, however, the company said the earnings should jump materially in summer months. For example, Funke's earnings were three times as high in those months as in the winter season.

Stopped Pilfering

More important than revenue to Bark was the cut in costs effected after the locks were installed. He said that his toilet paper bill alone was $3 per month, a figure cut 75 per cent after the locks were installed. He had one looking glass stolen and 12 drinking glasses taken when the toilets were open. Since the pay locks were installed and his facilities have been restricted to the motorist class nothing has disappeared, he said. This saving was effected at no additional expense, except that he modernized the wash rooms somewhat. A liquid soap dispenser and a little paint were the principal items of expense, he said. The dispenser cost $1.85 and the soap cost 85 cents per gallon.

Bark's station is located at the end of a street car line on the city limits. His station fronts on a main artery that leads to Routes 6, 20, and 2. By virtue of this situation his wash rooms were formerly filled with those leaving the street cars, WPA workers on a nearby project, patrons from a neighborhood restaurant, night owls patronizing a corner saloon, hitchhikers, "canned heat" boys hanging out in a nearby ravine, and women shoppers. Not one in any of these classes, so far as Bark knew, ever put a dime into his till in trade. But worse than this, he said, was that they messed up the facilities which were intended for patrons of the service station—and often such patrons were kept waiting.

The Chiselers Mutter

The station attendants reported that it was true some of the foot customers resented the locks, that they had often seen women go away muttering to themselves. But since these people are not patrons and have no appreciation of his problem of maintaining cleanliness, their mutterings bother Bark not at all.

On the contrary, how the locks have actually built good will is best illustrated with a single example cited by the dealer. The women's rest room and its pay lock are readily visible as a car drives into the station. A motorist and his wife drove into the station, purchased no gasoline or oil, but asked the attendant for nickels in change. As the woman walked toward the rest room, the attendant realized her intent. He politely explained that the pay lock was for pedestrians and a means of maintaining cleanliness, but free for motorists. He gave her a key.

The couple drove away, but the attendant was surprised to see them re-enter the station two minutes later.

"My tank will hold only four gallons," said the husband, "but my wife explained to me your courtesy and the cleanliness of the station. Put in what the tank will hold."

The women patrons' error would have been prevented if it had been practical to place on the outside door the same sign as the Texaco station has on the men's door. In letters 5 inches high the sign reads:

CUSTOMERS FREE
ASK FOR THE KEY

This sign builds goodwill because the motorist almost unconsciously appreciates in getting free something which is not available to all. It is the old story of the desire to "get something for nothing," and the gasoline and oil customers actually are getting something for nothing when the attendant grants them a pass key, because the pay locks mean extra cleanliness, at least, and should mean better equipment.

To capitalize on this "something for nothing" goodwill, it was suggested that each motorist driving to the pumps might be handed, when first greeted by the attendant, small envelope containing one or three slugs, depending on the number of passengers. The envelope would explain,

"Pay locks are installed on our restrooms to help us maintain absolute cleanliness. As our patron, you are welcome to this service. Please use the enclosed coin."

All service station men interviewed were in agreement that, if pay locks are installed, the patron has a right to expect for his money absolute cleanliness and more than a dingy room with worn fixtures.

First, all plumbing, particularly in the toilet, must be working properly. The wash basin should have running water and a stopper. Bar soap and paper towels are all right, but pay locks will more than afford liquid or grated soap and perhaps cloth towels. A waste paper basket is requisite. Toilet paper should be kept in a dust proof container. Pay locked stations, particularly in a women's rest room, require a well lighted mirror and a shelf.

But above all—if the remarks of the customers as reported by the dealers are an indication—cleanliness is the primary requisite, because a high standard of cleanliness is sufficiently rare as to be doubly appreciated.

	Goes to the Location
$2 gross receipts	20%
$2— $3 gross receipts	30%
$3— $4 gross receipts	40%
$4— $5 gross receipts	50%
$5—$10 gross receipts	55%
$10—$15 gross receipts	60%
$15—$20 gross receipts	65%
$25—$30 gross receipts	75%

Contents

NEWS

New Fund for Syphilis War to Spur Clean Toilet Drive 17
Senate Votes $13,000,000 For War Against Syphilis 17
Each Branch On Own Feet, Jobbers Cry 17
Call On Hull in Mexican Tangle 18
Ohio Oil Makes 1937 Report On Discovery Wells 20
Drive Against 'Gas' Tax Evasion Netted 221 Convictions in 1937... 20
Confiscation of 'Hot Oil' Upheld 21
Slant Drilling Ruled Trespass 21
Jackson Says 'No' to Plea from East Texas Refiners 21
Editorials 22
Industry's Advice Asked On Gasoline Price Reporting 23
Survey the Use of Credit Cards 23
Disclaim Evidence of Attendance of Two At 'Conspiracy' Meeting.. 24
Indiana Standard Seeks Rate Slash 27
U. S. Claims Elk Hills '16' 27
Major Purchaser Reducing Crude Oil Buying 20% 28
Pay-Locked Toilets Lessen Work, Cut Cost Build Customer Goodwill 30
N.P.N.'s Minimum Profit Standards for Nation's Service Station..... 31

MERCHANDISING

Women Shun Dirty Stations 33
Larger Jobber Profits With a Budget Yardstick 34
Three Modern Service Stations 38
Increasing Importance of Independent Jobber *by Elmer Ledbetter*.. 42
Ohio Jobber Wholesales Tires, Batteries, Accessories 48
Tank Wagon Prices Are Lower in April-June Contracts 50

MARKETS

Mid-Western 53
Mid-Continent 53
Eastern 53
Pennsylvania 53
Coastal 56
California 56
Fuel Oil 56
Refinery Tank Car Markets 54, 57
Tank Wagon Markets 58, 59, 60
Seaboard Markets 61
Crude Oil Markets....62, 63

Dictatorships for Research?

By ARCH L. FOSTER, Technical Editor

● Ultra-modernism in government and in sociological economics has apparently for its purpose the reduction of every individual, group and organization to the same mean level of accomplishment, or more exactly the same privileges of exploitation of the efforts of everyone else. Fascism, Nazi-ism, Communism in its innumerable misshapes, all agree violently on one premise—that all shall share and share alike in the benefits and advantages derivable from the intelligence, the perseverance and the work of those who work hardest, think most, and concentrate most tenaciously on perfecting a development, a process or an instrument which aids human progress.

The latest proposal in this country to force Tom to share with Dick and Harry the results of Tom's labors in the industrial laboratory is entitled H. R. 9259, "To Provide for Compulsory Licensing of Patents". In the great majority of cases patentees of important processes and products have been glad to license others for their use, in return for a given monetary consideration. This is not necessarily the case, and in many cases the sharing of results of research will immediately destroy any chance of return to the patentee of any considerable amount of the costs of development.

This new bill provides that the patent owner shall have exclusive rights under any patent only for the first three years of its 17-year normal life. After that any "interested party financially responsible" may make application for license under the said patent, applying not to the owner of the patent **but to the Commissioner of Patents,** now officed in Washington. Applicant shall offer terms and conditions of royalty; the Commissioner determines if the applicant's use of the patent is in the public interest, then notifies the patent owner to appear and show cause why the license should not be granted.

Note that the burden of proof is on the patent owner, **not** on the applicant. After publishing the notice of application for four consecutive weeks in the Patent Gazette and notifying the patent owner, the Commissioner sets a hearing date not more than 30 days after the last date of publication. **Any person may enter the hearing, and/or make a counter application for license.** The owner failing for any reason to appear to fight the application the Commissioner grants the license **on the applicant's terms!**

Whether or not license is granted following the hearing the Commissioner makes the decision, not the owner of the patent. The owner can then file appeal within 30 days against the decision, with a Board of Appeals composed of a lawyer, an engineer and an economist, appointed by the **President** with the consent of the Senate, as foreign diplomats are appointed. Failing in this Board the owner can appeal to the U. S. District Court in the district of his residence.

Space is too short to list the idiocies in this resolution. It isn't necessary to so list them, readers of this column can see in an instant what such a scheme would mean. The return which can be hoped for under the present system is that the inventor of a process or machine may sell his patent to those who will manufacture under it; or, he may make the product himself and so realize a competence from his intelligence, perseverance and expenditures in developing it. If, three years after a patent is issued anyone may use it on his own terms, no one will develop a new idea for patenting; more likely industrial engineers and chemists will attempt to retain new ideas as "trade secrets" and to use them exclusively without patent disclosures. With a minimum of three hearings and appeals on each application not only will a tremendous amount of work be generated for the legitimate attorneys employed in such work, but the opportunities for the shyster lawyer clan to chisel and fatten on applicant and patent owner alike will be enormous, to further stifle research.

The avowed purpose of the resolution's backers is to kill monopoly. The victim will be research—progress.

Refining Technology

●

Contents

Cracking and Dewaxing Units Modernize Bradford Plant R-147

Bradford Oil Refining spent $570,000 to build a new cracking-reforming unit, a new ketone-benzol unit for dewaxing Pennsylvania oils, double capacity of distillation unit, build an additional boiler, and re-lay entire piping system.

"State of the Art" as Seen in the World's Current Technical Literature R-157

A Study of the Chemical Composition of Surakhan Gasoline . . . by P. S. Panutin and E. N. Firsanova R-160

An analysis of a Russian gasoline shows a relatively high naphthene content. Metallic platinum deposited on charcoal was used as a dehydrogenation catalyst; percentages of naphthenes and substituted cycloparaffins are determined for the material studied.

Acid and Reactive Colloid for Water Treatment . . . by L. D. Betz R-167

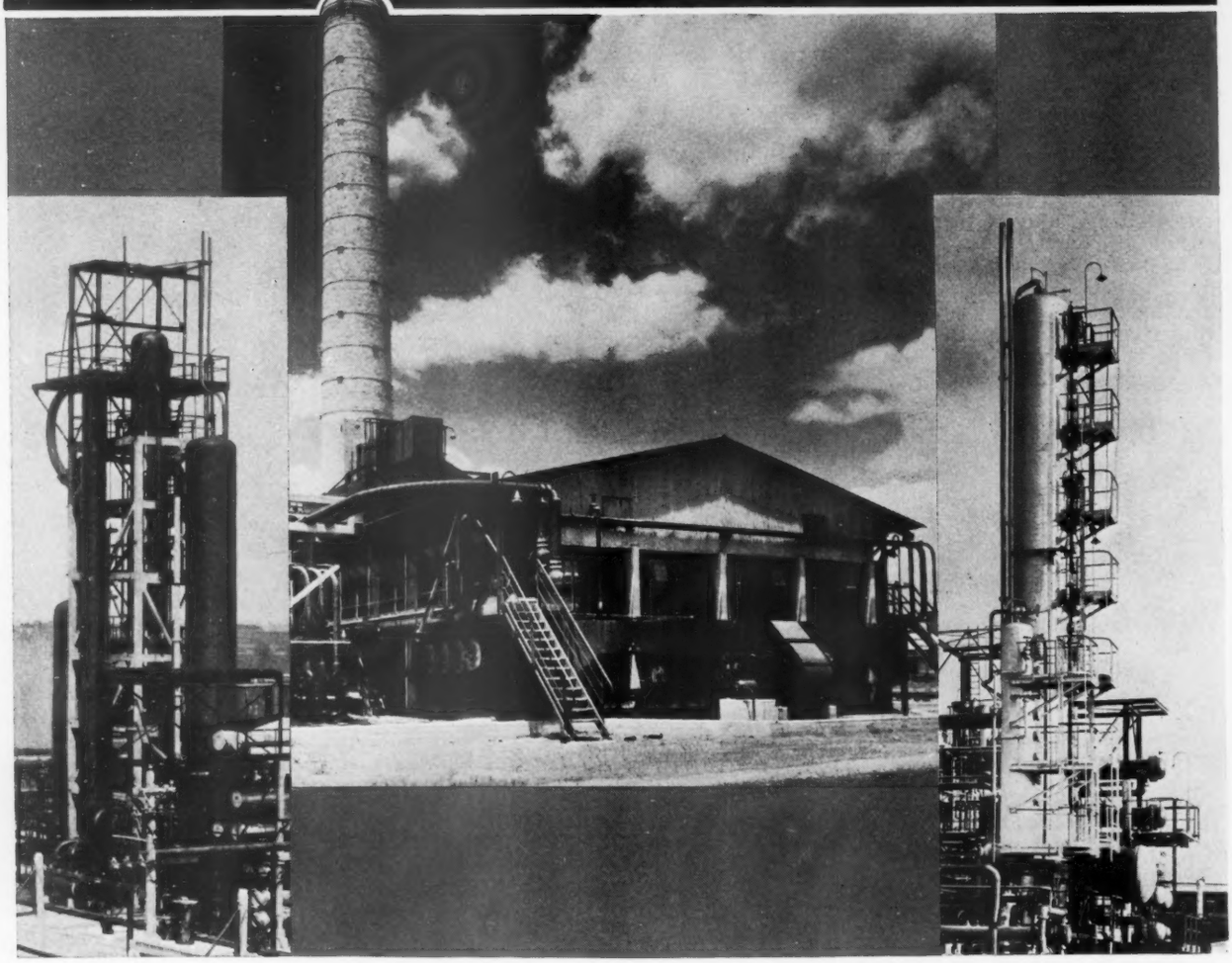
Comparative cost figures show that an acid-and-colloid system of treatment for types of waters discussed here in the most economical method of water treatment, especially for boiler waters. Installation and operating costs are included, with flowchart of typical treating unit, using sulfuric acid and a reactive colloid.

Patent Literature of Today R-174

Activities of Equipment Manufacturers R-176

Advertisers' Index . . . . . 64 and R-175

COORDINATED RESEARCH and OPERATING EXPERIENCE DEVELOP EFFICIENT REFINERY PROGRAMS



A refiner utilizing the research facilities, the engineering knowledge and the practical experience of construction and operation concentrated in the Kellogg organization is assured of a processing installation producing a sufficient range of finished products to meet present day marketing problems.

Operating records of Kellogg-built units constructed within the past year should be investigated by refiners contemplating the modernization of present plants or the construction of new units.

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Fig. 1. TVP reforming-cracking unit at Bradford Oil Refining Co.'s plant, showing vaporizer furnace, (left), and double end-fired superheater and cycle gas furnace (right). The unit in the left background is the modernized crude distillation unit

721.3
234.3
729.8

Cracking and Dewaxing Units Modernize Bradford Plant

By ARCH L. FOSTER
N. P. N. Technical Editor

A new TVP vapor phase cracking unit processes 800-1000 barrels of heavy Pennsylvania naphtha per day, yielding 80-82% of 70-72 octane number gasoline. This is the first commercial unit of the new design built to use the TVP process. Gases from the process are used to add part of the cracking heat needed in this unit.

An additional fractionating tower and three side-stripper towers were added to the primary crude unit, practically doubling its capacity. A 625-barrel ketone-benzol unit was built which simplifies the production of low cold-test oils with higher yields. A new 425-hp. boiler supplies the additional steam needed by the plant.

BRADFORD, Penna.

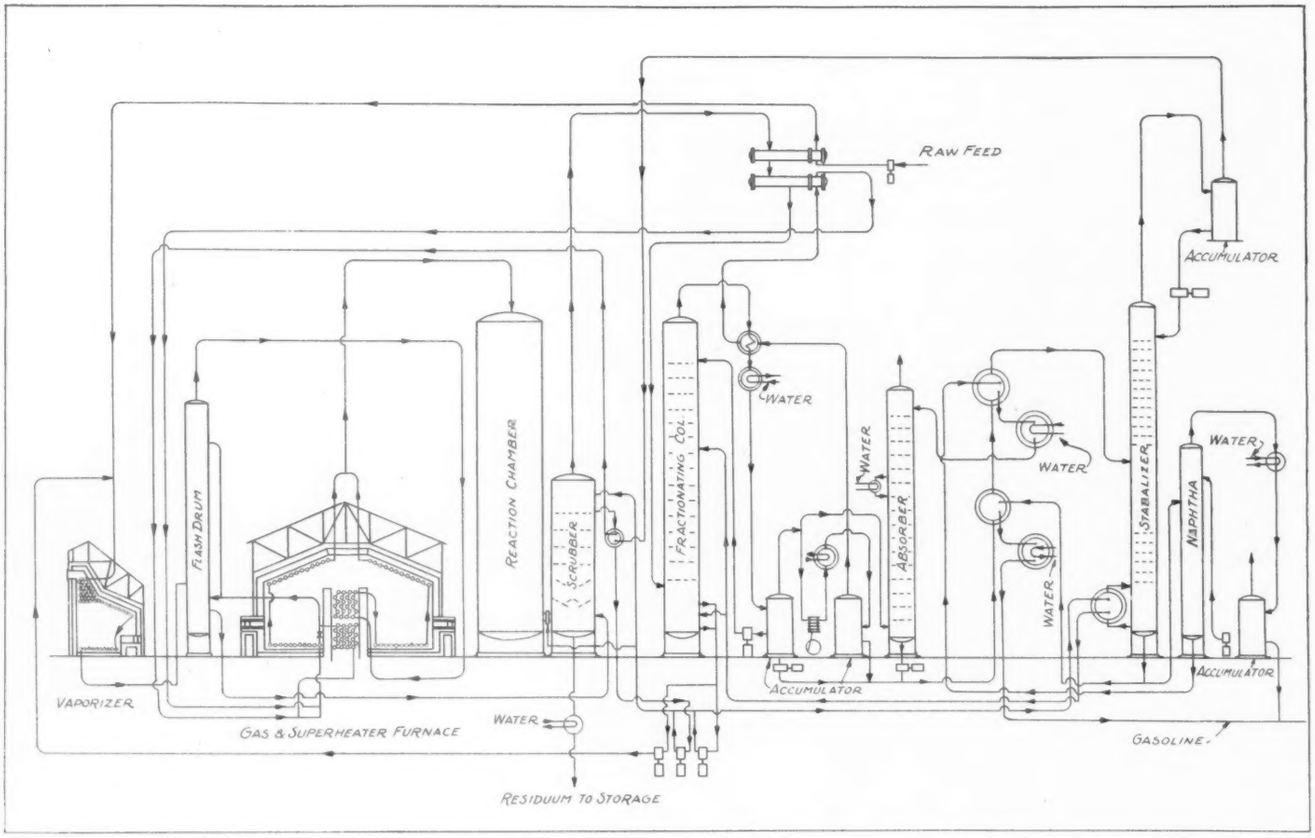
SPENDING more than half a million dollars to completely revamp and modernize its refinery, the Bradford Oil Refining Co., under the leadership of Dr. E. R. Lederer, nationally known petroleum refiner, has swung into the forefront of the most progressive Pennsylvania refiners, with equipment which enables it to manufacture the quality of refined products demanded by modern industry.

The new units in the Bradford plant include a new TVP cracking-reforming unit of 800 barrels daily charge capacity; additional tower and furnace capacity added to the crude unit, increasing it to 2700-3000 barrels per day; an entirely new ketone-benzol dewaxing unit designed to handle 625 barrels of lubricating oil per day; a complete revamping and re-laying of the piping system of the plant; 67,000 barrels of additional crude, intermediate, and finished product storage, a new type of truck loading rack, a 425 hp. boiler, and a large number of smaller items. In other words the plant is completely rebuilt from beginning to end, taking advantage of the newest in equipment and processing available to the 1938 refiner.

The primary crude distillation unit in the plant at the start of the modernization program was a 1500-barrel pipe still with one fractionating tower, 100 feet by 6½ feet diameter. To this was added another bubble tower 40 feet by six feet diameter, and three smaller stripper towers, for reducing side cuts to specifications. The furnace and pipe coil was revised to a two-coil arrangement, the whole raising the capacity to 3000 barrels of Bradford crude per day.

Crude is introduced into this unit through heat exchange with the hot cylinder stock bottoms from the main tower, is heated in the first flash coil and enters the new 40-foot tower. Overhead from this tower is taken a 250° F. endpoint light blending gasoline of about 67 octane number. This cut is pumped to and stabilized in the stabilizer which is part of the cracking unit assembly, along with the cracked gasoline. From the side of this primary tower is taken a heavy naphtha, up to about 20% of the crude, which naphtha is the normal charging stock for the cracking-reforming unit. This heavy cut usually has an endpoint of about 420-430° F.

Bottoms from the first tower pass to the second furnace coil, then to the old 100-foot tower, from which as



Flow diagram of TVP cracking-reforming unit at Bradford Oil Refining Co. Note the manner of heating charge and cycle gas separately, and later combining the two streams

many as five cuts may be taken. Overhead kerosine is made; either one or two cuts of gas oil may be made from the tower side, the number of cuts depending on the sales department's requirements at any given time. From the lower part of the tower either one or two cuts of wax distillate are taken, again depending on the needs of the plant and the sales department. These cuts are stripped with steam in the small side towers to the desired flash specifications, stripper vapors returning to the tower. The flash point and viscosity of the cylinder stock bottoms is determined by the amount of wax distillate made. The gas oil is either sold as such, as heating oil, or is used as charge for the cracking unit.

Cracking-Reforming Unit

The cracking unit, designed and built by Alcorn Combustion Co., provides for either naphtha reforming or gas oil cracking. Operating as a reforming unit, heavy naphtha is charged through a heat exchanger, against the overhead vapors from the scrubber (explained below), as these vapors pass to the fractionating tower, and thence to the vaporizer furnace. The heated charge then enters the flash drum, from which the naphtha vapors enter the main, double-end-fired furnace superheater coil. At the outlet of this coil the superheated vapors are mixed with the heated cycle gas. This gas is obtained as shown later partly from the top of the stabilizer; part of it comes from the heavy gasoline accumulator which is picked up by a compressor; both portions of gas are charged to the cycle gas heater coil, and at the outlet meet the superheated vapors mentioned above. The mixed vapors and gases enter the reaction chamber; part of the cycle gases, heated, can be bypassed to the flash drum to aid in vaporizing the charge.

Entrance to the reaction chamber is made through a manifold placed near the bottom of the chamber, equipped with three pipes of different lengths so that the charge is released in the scrubber at different levels at the will of the operator. The plant, the designers state, is designed for practically no cracking to take place in the heater coils but mostly to occur after mixing with the hot cycle gases. The vapors and the heated cycle gases can enter the reaction chamber separately, as may be chosen, without mixing ahead of the flash drum.

The mixed gases and vapors go to the scrubber from the reaction chamber. This scrubber is fitted with two top pans to break up the incoming vapor stream. Bottoms from this scrubber is fuel. The vapors from the scrubber top exchange heat with the incoming charge as shown above, also with the compressor gas on its way to the cycle gas heater coil, and enter the fractionating tower.

From the top of the bubble tower the cracked gasoline is cut to a maximum endpoint of 410° F., is condensed and goes to the heavy gasoline accumulator, from which the cycle gas is drawn for mixing with the superheated vapors.

FROM the heavy accumulator the gasoline goes to the "light" gasoline accumulator. Before entering this container, the gasoline meets the gases from the top of the first accumulator, by which these gases are stripped of any light recoverable vapors carried away by the gas, before this gas reaches the heat exchangers or coils.

From this accumulator the raw gasoline goes to the stabilizer reboiler, where it is heated by the heavy condensate from the top pans of the scrubber. It then exchanges heat with stabilized gasoline from the stabilizer bottom, and enters the middle section of this tower. The bottoms of stabilized gasoline exchanges with the incoming charge and thence to storage. The light straight-run gasoline is also stabilized similarly in this same tower, mixing with the cracked gasoline before entering the stabilizer unit. Gases from the stabilizer top return to the furnace coil, as outlined above.

Part of the gasoline from the stabilizer tower goes

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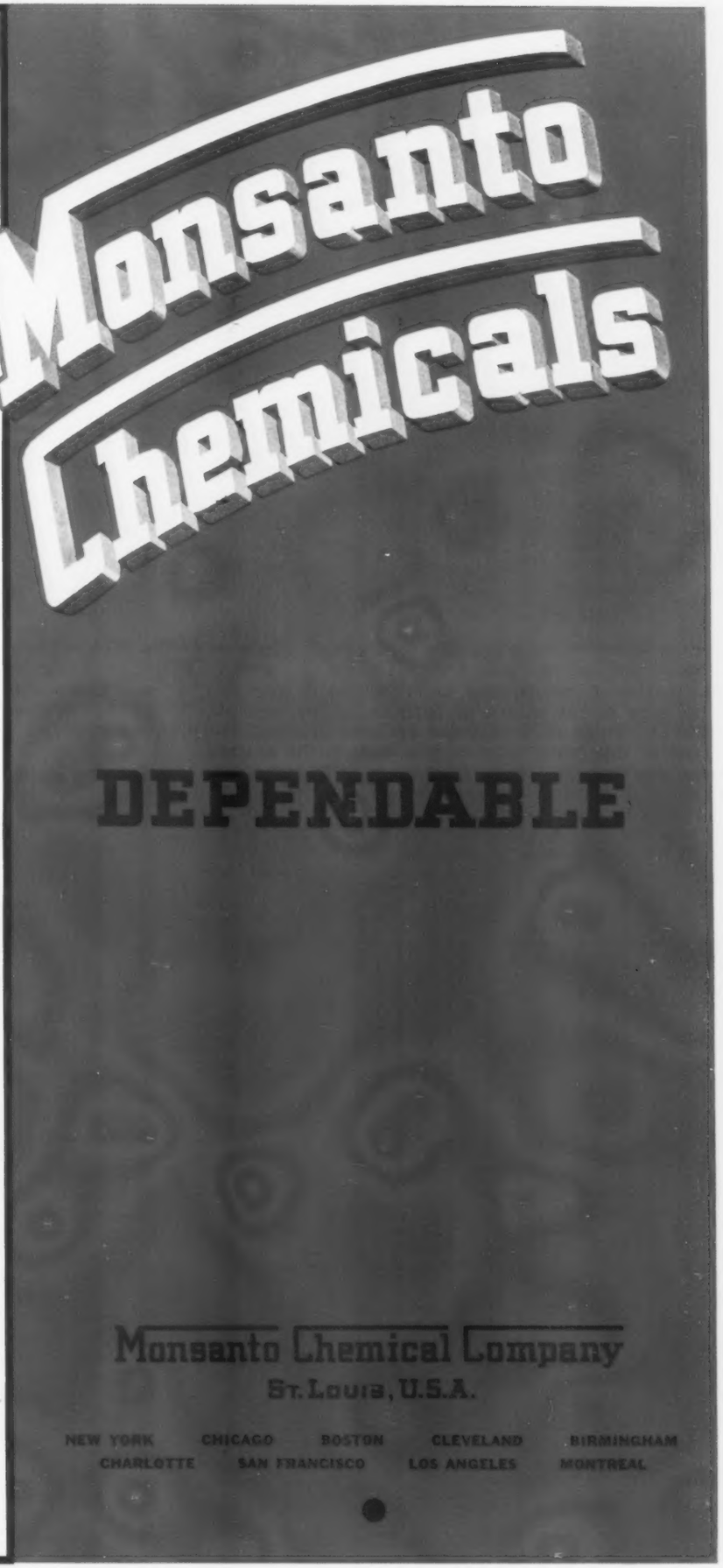

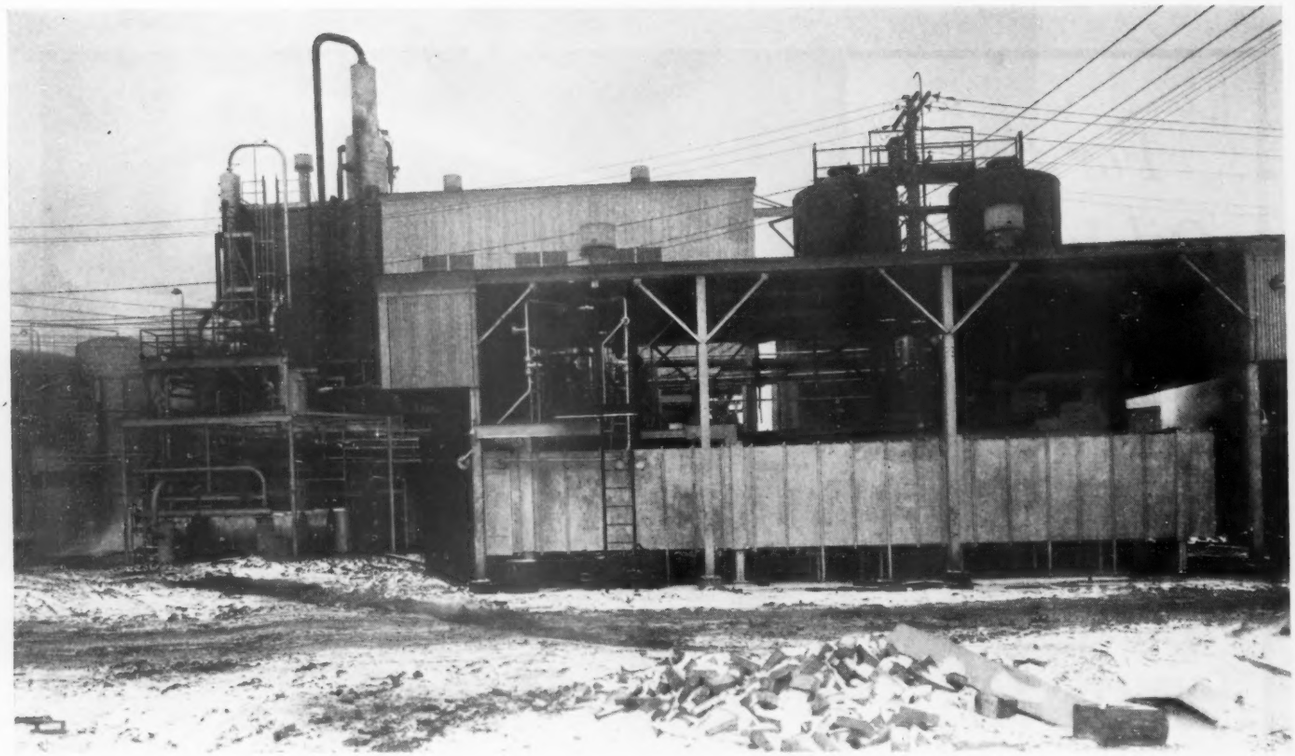

Fig. 2. Side view of dewaxing plant showing double pipe chiller building. The long enclosed box-like chiller in front is the flue gas chiller

to the middle of the naphtha tower — and is split into two fractions in any chosen proportions, as for example, to a 200° F. initial on the bottoms or heavy fraction. The light end of this "split" stream goes back to the finished gasoline storage, the heavy fraction goes to the vapor recovery unit as absorber "oil". The portion of the accumulator gas which does not go to the compressor as cycle gas goes to the absorber tower to remove whatever recoverable gasoline it may carry. From the tower overhead surplus gas is taken to the fuel system for use under stills and boilers, etc. In the recovery unit all hydrocarbons to and including n- and i-butane are recovered.

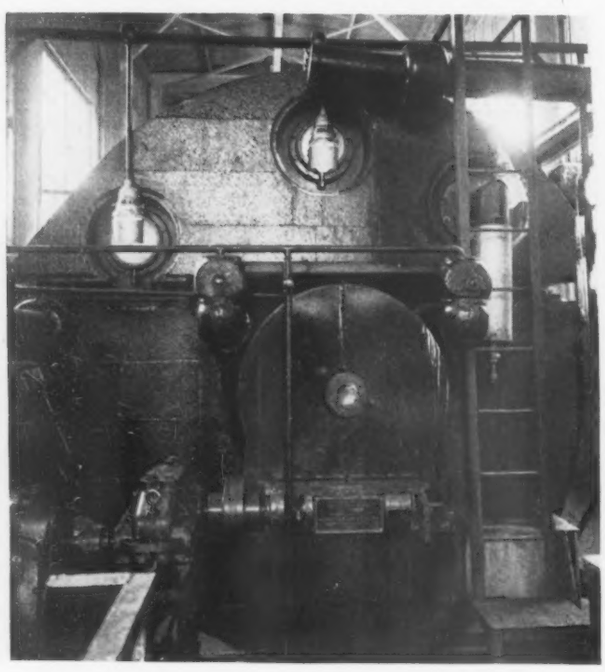

Fig. 6. Rear of Goslin-Birmingham filter, showing rotating motor, (left), and reduction gear operating filter drum. Three windows have lights placed in front of them for illuminating interior of filter, permitting visual examination of the operation

TABLE 1

Typical Specifications of Charge Stock and Product from Reforming Unit

	Charging Stock	Light Gasoline	Finished Gasoline
Gravity	53.0	75.0	63.5
10%	280	110	135 °F.
50%	315	174	226 °F.
90%	350	223	373 °F.
E. P.	420	252	410 °F.
V. P.		17.2	10.0
Octane No.	35	67	71.5
Recovery	98	93	96.5
Residue	1	1	1
Loss	1	6	2.5
Induction	..	..	4½ Hrs

This unit was designed to crack, or reform, 800 barrels of cold charge per day. It has processed between 900 and 1000 barrels per day in normal operation. The pressures used are nominal, up to 95 lbs. on the absorber, and as much as 125 lbs. on the reaction chamber. Worthington pumps are used throughout, except one Union pump. Masonneilan level controls and flowmeters, are used. Each pump is equipped with a Masonneilan control. One Leeds and Northrup 8-point recording potentiometer is installed on the instrument board, and one 44-point indicator potentiometer, covering practically all points in the unit.

Carbon steel tubes are used in the vaporizer furnace coils. Carbon-molybdenum tubes were installed in the superheater convection bank, while Sicromo No. 3 tubes are in the superheater floor tubes. Sicromo No. 5 tubes were considered most serviceable in the roof bank of the superheater and in the cycle gas coils. The convection bank of the cycle gas heater uses carbon steel tubes. Fittings and headers are 4-6% chrome, ½% molybdenum steel.

When reforming heavy naphtha the unit normally yields 80-82% of the charge as cracked gasoline which, when blended with the light straight-run gives 70-72 octane number gasoline. Only one run has been made as yet on gas oil, as the plant had a surplus of naphtha to reform when it started, and sales requirements have kept the unit operating on naphtha continuously since it started, excepting the one test run on gas oil.

The gasoline is doctor treated continuously in a

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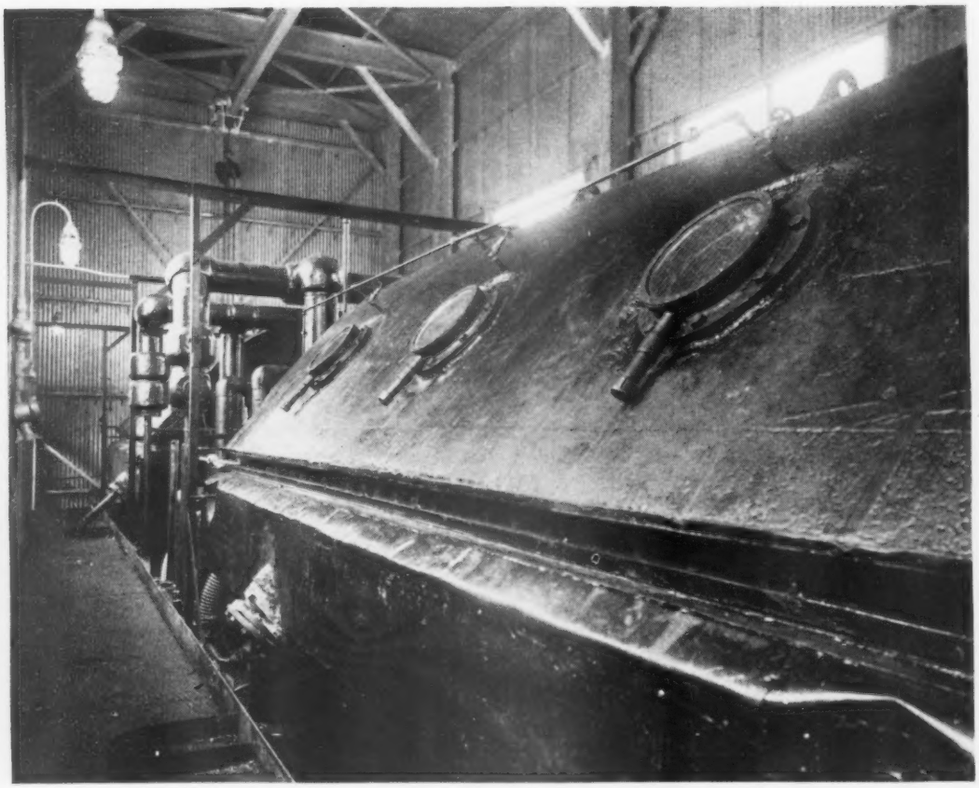


Fig. 3. Side view of Goslin-Birmingham vacuum filter. The "hand mirrors" on the side are look-doors

unit consisting of five 5 foot x 20 foot horizontal cylinders; in one cylinder doctor solution is added, in the second sulfur is added to break out the doctor. In the third it is water-washed, in the fourth sodium bisulfite is added, followed by a water wash in the last cylinder. The gasoline then goes to a sand filter to remove the last traces of sludge, etc., and this sand filter has been found to be extremely satisfactory, improving color and stability of the final product, costing very little to install and operate and is considered an indispensable part of the system. Kerosine is also treated before sale. This method of treating, using sodium bisulfite, is a novel method for which patent application has been made.

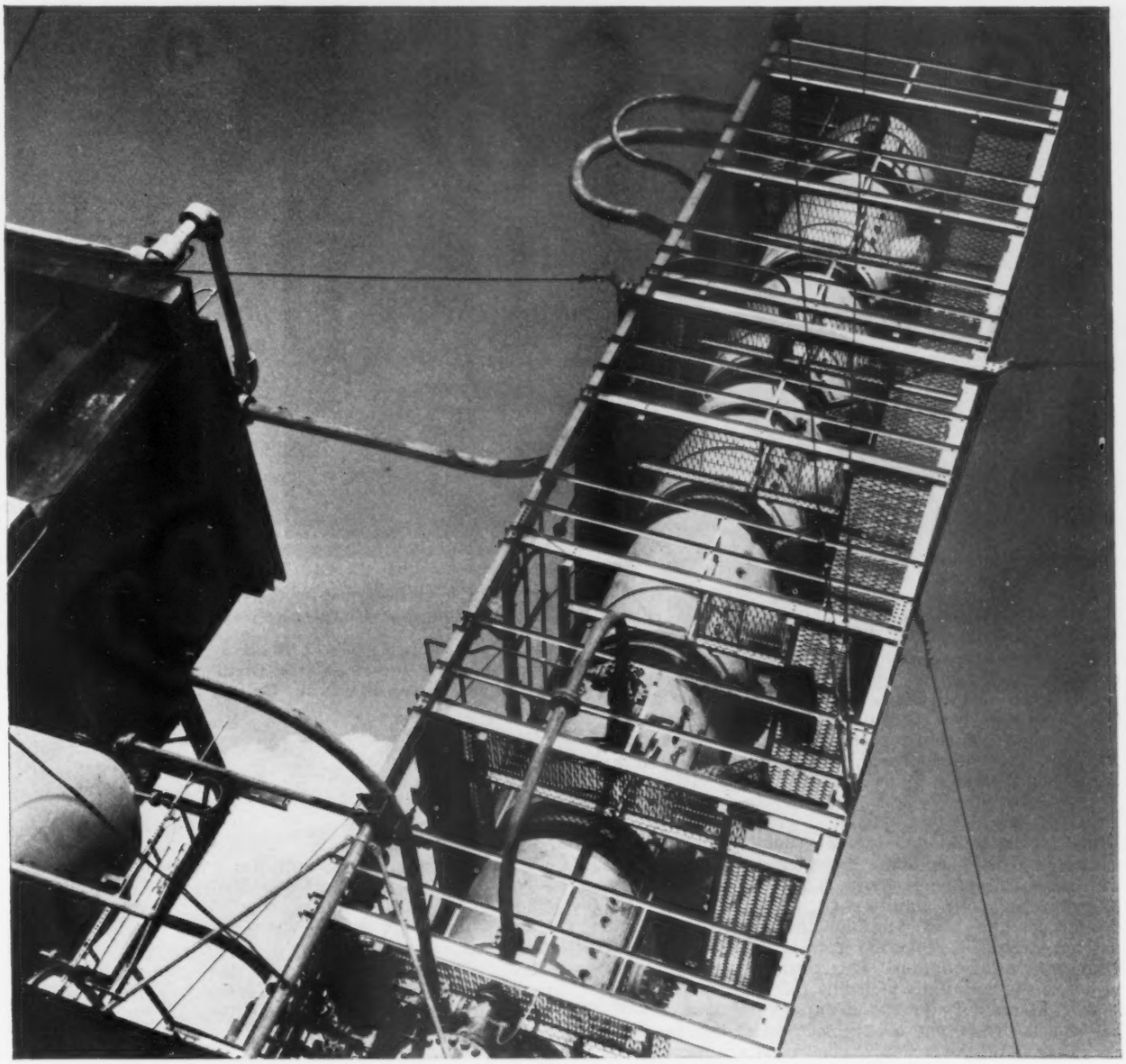
Ketone-Benzol Dewaxing Unit

The dewaxing unit, built by Lummus, handles either wax distillate or crude tower bottoms. This charge passes through a ratio flowmeter control where it is mixed with the desired proportion of solvent. The solvent is a blend of methyl-ethyl ketone and 90% benzol. Including the toluol in the benzol, the solvent for neutrals is normally 44% ketone, 44% benzol and 12% tuluol. For cylinder stocks the proportion usually is 38% ketone, 29% benzol and 33% toluol.

In dewaxing neutrals the ratio is 2½ parts solvent to one of oil. With cylinder stocks four parts of solvent to one of oil are used. The mixed solvent and oil pass into

Fig. 4. Control end view of both filters, showing filter heads, pressed oil lines and cold wash lines, also liquid level controls (center background)

THERMAL



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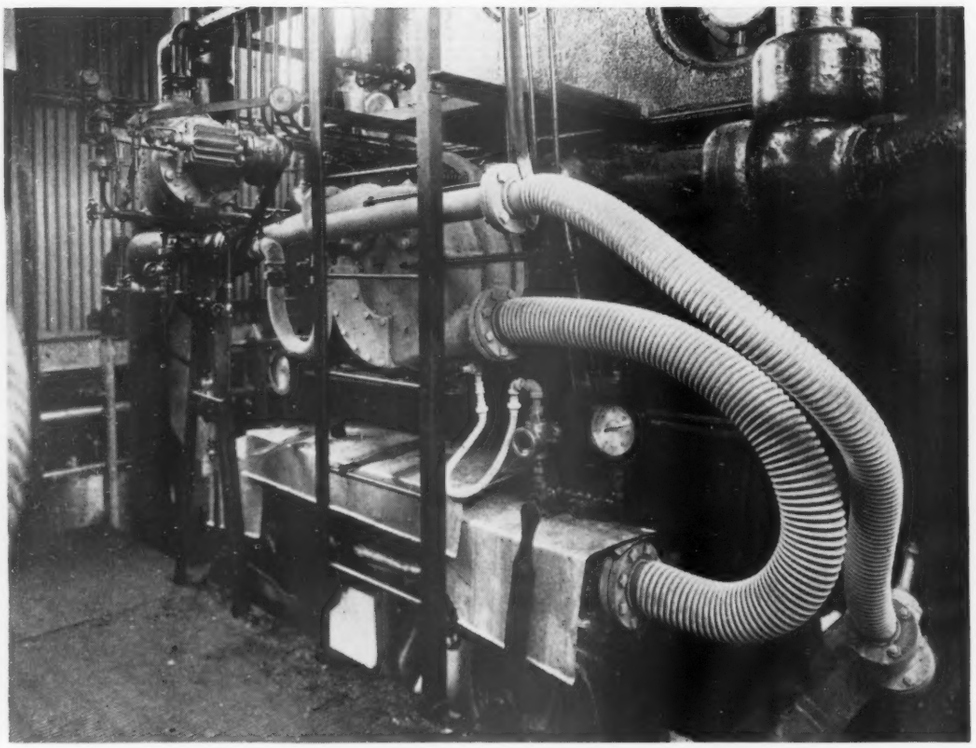


Fig. 5. Front view of one filter, showing float control for filter level. The frosted upper line is the flexible cold solvent wash connection; the lower flexible line is the pressed oil outlet connection

the Carbondale 2-pipe coolers and chillers, using cold oil in the coolers, and ammonia in the chiller coils. The chiller coils are placed on about a ½-inch to one foot incline to simplify evaporation of ammonia and prevent foaming. The solution is chilled to about 8° F. below the desired pour point of the finished oil, before passing into the filters.

The filters are two Goslin-Birmingham rotary drum vacuum type. A 26-inch vacuum is maintained on the line. On the filter hood pressure is maintained equal to about 7 inches of water.

THE filter drum is divided into 24 radial segments, not interconnected with each other but each connected to the outflow lines. The filter medium is 68-inch, 15-ounce unshrunk cotton sailcloth, chain-weave. Each drum has 500 square feet of filter area, and the drum is rotated by a G. E. motor through a reduction gear at the rate of about one revolution in 20 minutes. This drum rotates partially submerged in the solution which fills the lower part of the filter case. About 40% of the drum's filter area is submerged. As each section advances toward the remover scraper, the cake on the pad is washed with a solvent spray at the filtering temperature. Cold flue gas, at the filter temperature blankets the filter to prevent combustible vapors from finding their way out of the filter. The flue gas, water-washed and cooled, goes to a blower which forces it into the sections at a point near the scraper knife, placing pressure against the cake in reverse direction, loosening the cake and making it easy to remove with the knife, which is adjusted at about one-eighth inch away from the cloth surface. The wax falls into a screw conveyor, which carries it to the wax solvent recovery units. The flue gas used is boosted to six pounds pressure at the blower, which is reduced to three pounds at the filter by a hand valve.

The solvent is recovered in units somewhat similar to a natural gasoline system, small heaters and towers where oil and wax are heated, separately, and the solvent recovered for re-use. The ketone, boiling at about 160° F., is recovered from the waste water from steam condensate. Both come in to the tower; steam in the tower bottom vaporizes the ketone which is recovered overhead, the water passing to the sewer line and ketone to the solvent recovery tank. The dewaxed neutral is filtered through Magnesol or Filtrol. The contact plant and gasoline treating plant were designed by C. A. Barrere, general manager of the refinery, and have given excellent results.

TABLE 2
Typical Specifications of Wax Distillate and Long Residuum Charges for Dewaxing Unit of the Dewaxed Oils

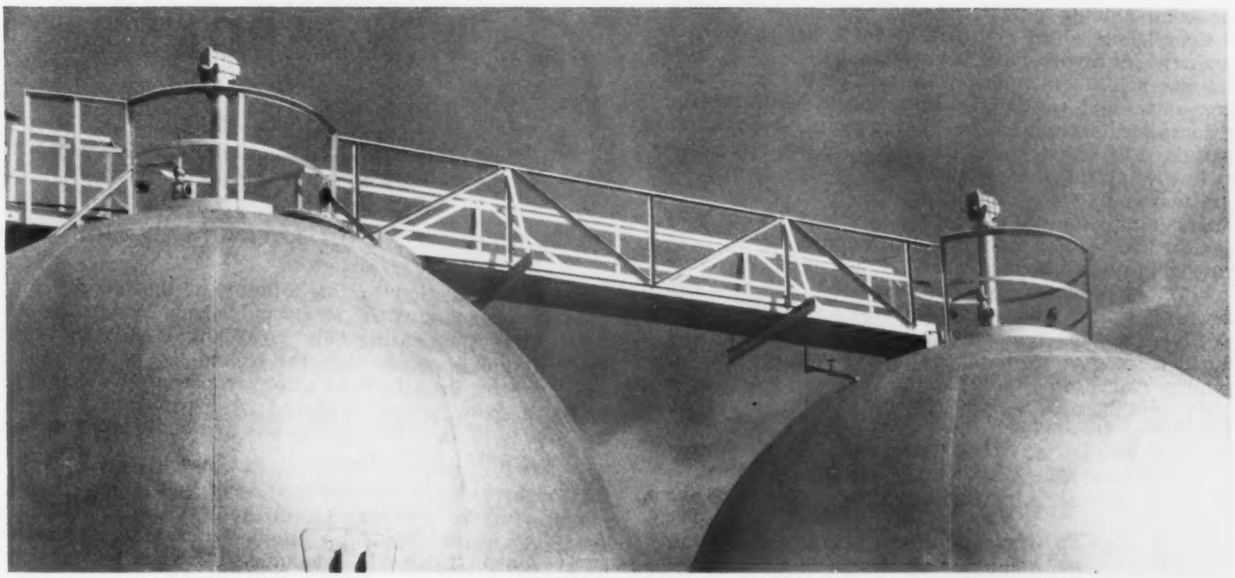
	Wax Distillate		Long Residuum	
	Charge	Dewaxed	Charge	Dewaxed
Gravity	31.5	30.5	28.1	26.9
Flash	430	430	480	480
Fire	485	485	530	530
Visc. @ 100	156	181	..	..
Visc. @ 210	...	...	83	87
Color	3+	3+	Green	Green
Pour	85	10	75	10
Chilling Temp.	0 to +5	..	+5	..

On January 7 this unit was "fired up"; on January 8 zero cold test oil was being stored in the plant's tanks. The wax from the neutral oil is about 20% of the charge, showing about 120° F. m.p. About 10% yield of wax is taken from the cylinder stock, with approximately 130° F. m.p. The plant was designed to handle 625 barrels of charge per day, but more than 700 barrels has been dewaxed in one day in normal operation. This system eliminates a centrifuge operation formerly used in the refinery.

THE dewaxing plant is housed in a 3-story building which includes a portion of the old building. The ammonia compressors were already installed, and York Ice machinery is used. The flow control valve used on the solution line to the filters is a Bellfield butterfly type which admits solution to the filter from a roof tank, from which it flows by gravity. Taylor pressure controllers are used on the filters, and the liquid-level controllers are Fisher, Bellfield and Taylor. L. &. N. potentiometers and recorders are used, with Crawford flow controllers, Crosby steam gauges, and Foxboro indicating flowmeters, Valve Precisors, and pressure recording controllers. A liquid level alarm by Shand and Jurs which prevents any neglect from causing accidents. Recording ratio flow controllers are Foxboro with recording flow controllers by Brown and by Taylor.

General Rebuilding of Plant

In addition to the two main units described above a new Erie 400 hp. 3-drum bent tube boiler was added to the boiler plant, which now uses gas fuel instead of coal. A feed water heater was built which brings the boiler feed to 230° F. before admission to the boiler drum. This is



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a baffled tank, water enters at the top where a 10-lb pop valve is also placed. Steam enters at about the sixth pan, the pans being slotted, the water spilling over each in turn and encountering the upward-passing steam.

The compounding plant has also been modernized, a second floor being added and arranged for package goods storage; new conveyors have been installed.

New six-inch steam mains were laid to the crude and cracking units, and to the dewaxing plant, with returns of the same size from each, so that only make-up water need be added to the steam system. A new six-inch crude suction line was laid, in fact the whole piping system of the plant was completely revamped.

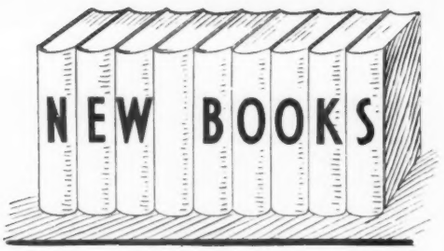
A new pump house for loading cars and trucks was built. A truck loading rack, which handles six trucks simultaneously was installed, so designed that three or four different products can be loaded from each position. One new well was drilled, equipped with a Byron-Jackson pump delivering 1200 gallons per minute. The old well was redrilled, screens were placed in the well, and a 400 g.p.m. pump placed on the old well. The fire system was completely rebuilt, and a new lube oil vacuum dryer installed.

New tank storage of 67,000 barrels total capacity was erected, which includes one 37,000 barrel tank, two of 8000 barrels, two of 5000 barrels, two 1000 barrels each, and one 500 barrel tank.

From these data it is obvious that the old Bradford Oil Refining Co. has been completely renovated, in fact a new plant operates where the old one did. Even a new heavy-wire fence has been erected around it. About all that is left of the old refinery are a few tanks, a few buildings, a boiler or two, and a few odds and ends here and there which could be used successfully in the new system.

As preliminary operation of the cracking unit on gas oil has not been carried out exhaustively as pointed out above, the results of this operation will be discussed in a later article, according to present plans, as soon as sufficient data has been collected to determine just what the system will accomplish in cracking Pennsylvania gas oils from Bradford crude, which is used exclusively in this refinery.

Allan H. Calderwood, new manager of Shell Oil Co.'s Martinez refinery, did not always sit at a desk. He started with Shell in 1923 and his initial positions were assistant draftsman and pipe fitter's helper. After experience in all phases of petroleum manufacturing, he was made assistant manager at the company's Dominguez refinery and then assistant at the more important Martinez plant, the position he held up to his new appointment



LUBRICATING OIL REFINING METHODS

An introduction to the refining of lubricating oils is offered to readers of the newly published "Modern Methods of Refining Lubricating Oils" by Vladimir A. Kalichevsky. Without going deeply into the technology of the refining of lubricating oils, the book affords a perspective of refining methods now being employed and provides a general knowledge of how lubricating oils are being manufactured by the several methods.

Opportunity is offered in nearly every paragraph to explore further a given subject in literature to which reference is made. The total number of these references in close to 750. The book is valuable therefore to those who desire a perspective of present day refining methods whether they are unacquainted with the field or concerned with only one phase of it.

The introductory chapter of this 235-page book deals with the properties of refined oils. This is followed by a general discussion of modern refining methods in which sulfuric acid and solvent refining methods are compared. Subsequent chapters then deal with waxes, its removal from oils with filter-aids and by means of solvents and removal of oil from wax. Asphaltic substances are then described with chapters devoted to conventional methods and with solvents. The general principles of solvent refining are discussed in chapter 10 which is followed by discussion of the variables involved, use of single solvents, mixed solvents, double solvents, and disposal of solvent extracts.

Pour point depressants, viscosity index improvers, oiliness carriers, oxidation inhibitors, and finally fluorescence are each treated in separate chapters. Following a 10-page appendix of tables and equations is a patent index, extensive author index of literature to which reference is made, and a subject index. Although the book contains a few illustrations in the form of photographs of plants, the most serious objection that can be made is its total lack of diagrammatic layouts and illustrations of individual pieces of equipment used in the various refining methods. However, the book should be of considerable interest to those who want to acquaint themselves with this branch of the industry as it exists today, particularly since it stands alone as the only one of its type.

The book is available in the Book Department of NATIONAL PETROLEUM NEWS at $6.

Geologists Move to Tulsa

TULSA, April 4.—R. C. Earlougher and Lincoln M. Arnold, formerly with the Sloan and Zook companies of Bradford, Pa., are now with Geologic Standards Co., which maintains commercial oil sand testing and water flood engineering laboratories here.

Earlougher will be in charge of oil sand tests and research and development problems in water flooding, a field in which he has specialized since graduation from the Colorado School of Mines. Arnold, a graduate of Ohio State University, will handle evaluation of oil properties in connection with core analysis data and the statistical and financial planning of water flood projects.

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BY M. G. VAN VOORHIS
N. P. N. Staff Writer

Alcohol-Gasoline Water Tolerance

*Water tolerance in alcohol-gasoline mixtures is calculated in a general empirical equation. O. C. Bridgeman and Elizabeth W. Aldrich, Bur. Stds. RP*1059.

A general empirical equation has been developed by which to determine the water tolerances of mixtures of gasoline with ethyl alcohol.

$$\log S = f_1(P) + \frac{f_2(P) + K f_3(P)}{410}\left[1 - \frac{410}{T}\right]$$

where S = volume percentage water in mixture at 60° F.
P = volume percentage of gasoline in the mixture
K = characteristic constant as regards water tolerance in mixtures
T = temperature in degrees Centrigrade absolute

$$f_1(P) = -1.177 + 1.273 \log (100 - P)$$
$$f_2(P) = -188.3 + 7.64P - 0.119P^2 + 0.00083P^3$$
$$f_3(P) = 1.004 - 1.8 \times 10^{-4}(P - 55)^2$$

The constant K varies from 421 to 669 in 23 gasolines on which tests were made, and the average is about 550.

Accuracy of the equation was checked by computing all of the critical solution data. The grand average deviation on the 23 gasolines was 2.6° F. which corresponds to a deviation of approximately 0.005% in water content and to a difference of about 10 units in the value of *K*.

In 5% and 10% alcohol mixtures (P = 95 and 90) the water tolerance is less than half as great in the 5% mixture as in the 10% mixture. At ordinary room temperature, the water tolerance of the 5% in average gasoline mixture is about 0.15% as compared with 0.35% for the 10% mixture.

* * *

Polymerization Rate for Ethylene

Gas-phase and liquid-phase polymerization of ethylene takes place at about the same rate of reaction. R. F. Russell and H. C. Hottel, Ind. Eng. Chem., Ind. Ed., Feb. 1938, *p.* 183.

Prompted by the desire to determine how cracking and uncatalyzed polymerization differ as to reaction order and effect of temperature on reaction rate when the reaction is carried out in a single phase, either gaseous or liquid, investigation of polymerization of ethylene in the gas or liquid phase when dissolved in liquid naphthalene to the same concentration showed little difference in the rate. This was true in spite of the presence in the liquid-phase reaction of 14 molecules of naphthalene for every one of ethylene.

Naphthalene was chosen as a solvent for ethylene because of its high critical temperature, resistance to cracking at high temperature, ease of separation, and chemical stability towards ethylene. The polymerization is a second-order reaction in its early stages in the gas phase. In the liquid phase there is evidence in the early stages of an order of 2.6 but whether the gas- and liquid-phase reactions are actually of different order is open to conjecture.

The experimentally determined order of the reaction may be non-integral without being unreasonable, it is believed, though the equation expressing rate will be valid only in a restricted range of the variables involved. The fact of the presence of other reactions when the percentage of polymerization is appreciable throws doubt on assuming a reaction order of 2.6. Occurrence of secondary reactions between ethylene and its polymers is indicated by the fact that the reaction rate does not drop. More conclusive evidence for reaction order awaits study of runs involving a smaller percentage of polymerization and investigation of the possibility of a mild catalytic effect of naphthalene (by using some other solvent).

The reaction was found to tbe homogeneous and the corrected energy of activation was 40,000 calories per gram mole for the liquid-phase reaction and 42,100 for the gas-phase reaction. The effect of temperature on the primary reaction was to double the rate every 26° F. over the range 640-780° F. A fair degree of consistency of results was shown as long as they are based upon runs in which no more than 20-30% of the ethylene has disappeared. The nature of the gaseous products of the polymerization could not be determined readily because of the small quantities formed each time.

Accuracy of the polymerization studies was checked by several different tests. These involved tests for the presence of but one phase by comparing naphthalene weights in the reactor, accuracy of measurements, assumption of no holdup of ethylene by solidified naphthalene, catalytic effect of the walls, and possibility of naphthalene reacting with ethylene.

* * *

Separation of Olefines and Aromatics

Comparison of methods for determination of olefin and aromatics shows most reliable procedure. J. W. Wells and J. E. Hedrick, Refiner, March, 1938, *p.* 95.

An accurate and practical method for determination of olefins and aromatics employs sulfuric acid to determine the combined aromatics and olefins followed by separate determination of the olefins with sulfur monochloride. This method was selected from several of the present methods as a result of comparative tests of several methods using synthetic hydrocarbon mixtures.

Catalysts such as boric acid and phosphorus pentoxide have some inhibiting action, but their variable action made results wholly unreliable. Nitration as a method for the determination is also unsatisfactory. The most suitable method found was a modification of that of Faragher, Morrell, and Levine (Ind. Eng. Chem., Anal. Ed., 2, 18, 1930).

Distillation apparatus for the tests consisted of an insulated 200-cc. flask surmounted by an insulated Hempel column six inches high and containing four inches of glass beads. The side-arm of the column was connected to a vertical water-cooled condenser 14 inches long. Windows were provided in the insulation of flask and column for observation and to allow heat loss for condensation of vapor for reflux so that the column could be operated just short of priming.

Polymerization was found to increase with increase in

sulfuric acid strength and was also a function of time of contact, temperature and acid ratio. Solution loss increased with concentration increase, time of contact, acid ratio, and temperature increase. Olefine separation by treatment with sulfur monochloride was approximately quantitative. Aniline point determination, however, is not accurate because of the presence of small amounts of reaction products in the oil.

Results obtained on nitration of olefin-free oil with the sulfur monochloride treatment in all cases exceeded the sum of olefines and aromatics, making impossible the calculation of olefines and aromatics separately from this determination. In treatment with sulfuric acid containing boric acid for determination of olefins the results were not reliable, being in all cases too high. Determination of aromatics on either the oil from the boric acid treatment or the original oil also gave unreliable results. Changing the time of contact, temperature, the relative volume of acid did not materially adjust the accuracy of the method.

R. H. Maples Joins A. P. I. Dallas Staff

DALLAS, March 31.—R. H. Maples has been appointed staff engineer for the American Petroleum Institute's production division, with headquarters at Dallas. Graduated in petroleum engineering from the University of Oklahoma, Maples has had several years' experience in the Mid-Continent field, and was division engineer for Cities Service Oil Co. in East Texas when he was appointed to the new position. He has been especially active in the work of the Central Committees on Drilling and Production Practice, and on District Activities during his term of field experience.

Ector County Plant Operating

ODESSA, Tex., March 31. — The new natural gasoline plant of the Barnsdal Oil Corp., three miles northwest of here, has been completed and placed in operation. The plant is connected to 110 wells in the Ector county fields. The plant cost approximately $375,000, it was said.

Crude and Refined

Filtration and Filter Media

The last three or four years have seen remarkable strides made in the production of filter materials for decolorizing lubricating oils. The writer can remember when the bone-black industry was expected to supply most of the demand for a decolorizing agent. Then fuller's earth became a second choice, next a first choice, and finally ran bone-black out of the picture.

Recently a bauxite derivative was placed on the market and to date seven or eight refiners have adopted it for use, we are told. Of course bauxite has been used for some years to a limited extent so this cannot be called a new development. But its conditioning for 1938 filtering has progressed far beyond that of a few years ago.

Another filter aid, something referred to as a semi-synthetic product, is being used in various refineries, showing a high technical efficiency, especially in decolorizing heavy stocks at high temperatures without the necessity for diluting the stocks with naphtha. This system is said to be expensive in comparison with some other methods, but reduces the time of product in passing through the refining system, and also is said to be remarkably efficient in decolorizing.

Now a new source of bauxite, specially conditioned for use as an oil treating medium, has been developed and it is understood deliveries of the product have already begun. This bauxite comes also from Arkansas where most of the country's bauxite deposits appear to be located. The material will be marketed on a national scale to the refining industry, we understand.

* * *

Sifting England for Oil

More than 26 per cent of the island of England, seat of the world's largest empire, is under license for oil exploration, according to British advices. Four companies hold exploration licenses on nearly 14,000 acres, located especially in Dorset, Kent, Somerset, Sussex and Wilshire.

Two of the four companies most active in this exploration are the Gulf Exploration Co. of Great Britain, and the D'Arcy Exploration Co., Ltd., a British owned company. Of the area under license, 80-odd square miles are in Scotland, the home of oil shale operations older than the petroleum industry. The Gulf company has nearly 2000 square miles of English territory to study.

It is necessary to do very little thinking to find two very important reasons why British should be so intensively investigating her home petroleum possibilities. The ever-present one is that British interests have fingers in practically every oil "pie" in the world, yet practically all home requirements must be imported either as crude or refined products. The second reason, of potentially great importance just now is the world political situation, and the variously estimated possibilities of war on several fronts which may embroil England. Against a strong maritime power at war, it is possible that England's oil supply might be cut off or seriously interfered with, hence the need for at least a sufficient supply at home for emergencies. It is difficult to visualize a modern war in which petroleum will not play a most serious role.

A third reason which doubtless has a considerable influence on this intensified exploratory activity is that, although technically quite successful according to reports, the British attempt to produce large quantities of hydrocarbon motor fuels, and so on by hydrogenation and polymerization methods has fallen far short of success, economically. Costs have approached the prohibitive, if reports are to be credited. Although in emergency cost becomes no controlling factor, yet a liquid fuel industry, to be ready for war emergencies, must at least pay its way in peace time; otherwise it cannot be in condition to produce the needed materials on short notice.

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A Study of the Chemical Composition Of Surakhan Gasoline*

By P. S. PANUTIN and E. N. FIRSANOVA

THE work of recent years, carried out mostly in the United States, has established with sufficient clarity not only the qualitative but also the quantitative composition of straight run gasolines from different crudes.

The results indicated that, despite a very thorough investigation, it has been impossible to determine the presence of some hydrocarbons, although their homologs and isomers were found without any difficulty. Other hydrocarbons were found in practically negligible quantities—to the extent of one hundredth of one per cent of the gasoline fraction. The isolation of these hydrocarbons necessitates a better experimental technique and much larger quantities of starting material.

In view of the obtained results it now becomes doubtful if gasolines contain all possible classes and isomers of hydrocarbons. The present study has been undertaken to test this and also to collect more data on the quantitative composition of naphthenic gasolines. The application of different methods of analysis also presented considerable interest. Until very recently each investigator attempted a different approach to the problem and even at the present there are no set rules even for the simple problem of gasoline rectification: some authors prefer to isolate one degree fractions by applying numerous fractionations, which is undoubtedly connected with great losses; others use chemical means and apply them to much larger fractions. In principle the first method is much more tempting, however, large quantities of starting material and very efficient columns are required.

Separating the gasoline into more or less narrow cuts and determining some of the physico-chemical constants, such as the index of refraction, aniline points, melting points, etc. enables one to form a fairly definite idea of the chemical composition of the gasoline. Such a method was used by R. A. Virobyanz[1], who studied the chemical composition of Caucasian gasolines and obtained some very interesting results.

Separation by physical means served as a basic method in a number of investigations. Fractionation was used by Markovnikov[2], Mendeleev[3], Young[4], Bruun and Hicks-Bruun[5] and others. Recently Fenske, Quiggle and Tongberg[6] applied such efficient fractionation that they were able to obtain almost pure individual compounds. Fractionation with the introduction of a third liquid, as shown by the work of Brame and Hunter[7], seldom gives good results. The exception to this is the use of aniline which gives a good separation when it is added to a mixture of naphthenic and paraffinic hydrocarbons.

The next method of a physical chemical nature is partial crystallization from liquid propane, methane and other solvents. Using this method, Leslie[8], Bruun and Hicks-Bruun[9] were able to obtain individual compounds from petroleum fractions. The separation of hydrocarbons by means of extraction of different groups applies mainly to heavier fractions and is apparently of little use for gasoline fractions. Even in the best cases one can count on only a small increase in the concentration of aromatic hydrocarbons in the different layers. Experiments[10] have shown that ethyl alcohol extraction does not change the ratio of paraffins to the naphthenes in the upper layer. A similar result was obtained in the case of action of levulinic acid on cracked gasoline. A large amount of data available in the literature shows that this applies to a large number of compounds.

After the fractions have been treated with a certain reagent it is highly desirable to regenerate the removed hydrocarbons. At the present time one of the examples of this is the sulfonation of aromatics, thus creating the tendency to quantitatively convert certain classes of hydrocarbons into aromatics. One of these methods is the dehydrogenation catalysis of six-membered naphthenes. The recent work of Academy Member N. D. Zelinsky and coworkers indicates that one must scrutinize the results obtained by this method very closely, because, on one hand, cyclopentane derivatives may be converted to paraffins following the breaking of the ring, and, on the other hand, the aromatics obtained by the dehydrogenation of six-membered rings may be converted into other benzene derivatives. The latter are obtained from the products of a complete break-down of the molecule by splitting off methyl radicals.

Thus, it becomes apparent that the application of

Conclusions

1) The use of the described fractionating column makes possible a sharp separation of the gasoline into 4-5° fractions. The losses were small.

2) A quantitative determination of the six- and five membered naphthenes can be carried out using the method of dehydrogenation catalysis. It was found that the major constituents of this gasoline are methylcyclohexane, cyclohexane and dimethylcyclohexane.

3) The catalyzate from dehydrogenation over platinum was found to contain large quantities of meta-xylene. Both meta and para compounds were isolated in pure state. Although pure ortho-xylene has not been obtained its presence is highly probable.

4) The method of removal tertiary hydrocarbons using antimony pentachloride has been tried out. It was found that with a complex mixture of hydrocarbons the reaction also removes some of the other hydrocarbons along with those containing tertiary hydrogen atoms. This method cannot be used for a quantitative determination and a complete removal of tertiary hydrocarbons is possible only if a large excess of $SbCl_5$ is used. The reaction involves high losses of the product.

5) With the aid of the reaction with $SbCl_5$ it has been established that Surakhan gasoline contains normal heptane and 2,2-dimethylpentane but not normal octane.

*A translation from the original in Chim. Tverd. Topliva, 6 (9), 801-14 (1935), arranged by the Petroleum Division of the American Chemical Society.

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dehydrogenation catalysis is highly problematical and it is essential to test the products for possible side reactions.

The separation of five membered naphthenes from the paraffins cannot, at the present, be successfully accomplished. The conversion of cyclic hydrocarbons into ketones by the Friedel and Crafts reaction is so sensitive that for each mixture one must first determine the special conditions without which the reaction will not take place. Another disadvantage is that paraffins also react very easily with $AlCl_3$, thus making the reaction hardly applicable to the separation of hydrocarbons.

The only method which allows the separation of certain five-membered rings and paraffins appears to be the one suggested by Schaarschmidt[15], based on the action of antimony pentachloride upon hydrocarbons with tertiary hydrogen atoms without reacting with compounds having secondary and quartenary hydrogen atoms. We have decided to adopt this method in view of its simplicity, however, test mixtures had to be used preliminary to the application to different gasoline fractions. Although a second article by Schaarschmidt and Marder[16] brought more light on the subject, we do not consider it superfluous to report our results here.

Experimental Part

The gasoline used in this investigation was taken from the Surakhan crude of the sixth stratum and prepared for a special purpose. An Engler distillation gave the following results:

° C.	%	° C.	%
Initial 68	...	140—150	95.0
68— 80	4.9	150—160	96.0
80— 90	23.9	160—170	96.8
90—100	51.2	170—180	97.8
100—110	70.5	180—190	98.5
110—120	82.3	190—194	99.4
120—130	89.1	Bottoms	0.6
130—140	92.8		

The fractionation was carried out in a special rectification apparatus consisting of a 30 liter copper container and a three meter packed column. A water cooled dephlegmator at the top of the column made reflux control very easy. The distillate first went through a small cooler and into a receiver. The cooling capacity, as it was found out later, was insufficient for complete condensation of the vapors and we suffered a constant loss of the light boiling fractions, amounting to about 6-8% of the charging stock. The column was electrically heated, the average throughput was about 700 grams per hour, so that during 12-13 hours we obtained about 8-10 kilograms of gasoline separated into five degree fractions. The purity of the fractions was tested by an Engler distillation. Using the above rate, the main fractions, containing definite compounds, distilled within 90% of their limits; however, intermediate fractions showed a much wider range. The results are shown in Table 1.

TABLE 1

Single Fractionation of Surakhan Gasoline

Boiling pt. in °C.	%	Boiling pt. in °C.	%
Up to 48	3.3	98.0—103	14.9
48.0—65.5	1.8	103.0—111	10.2
65.5—69.5	2.9	111.0—115	2.7
69.6—74.0	2.9	115.0—118	2.3
74.0—79.0	4.1	118.0—122.5	4.3
79.8—83.0	6.1	122.5—128	6.8
83.0—85.5	4.2	128.0—134.5	2.9
85.5—89.5	2.6	134.5—higher	2.5
89.5—91.0	7.7	Bottoms	7.3
94.0—98.0	3.5	Loss	8.7

The separate fractions were treated with three volumes of 98% sulfuric acid. Following this treatment the differences between various fractions became more distinct.

TABLE 2

Naphthenic Content of Fractions*

B. P. in °C.	Aniline point	Naphthenes, in per cent
65.5—69.5	61.4°	28.5
69.5—74.0	51.2	57.4
74.0—79.0	42.7	80.6
79.0—83.0	41.5	83.5
83.0—85.5	46.5	71.5
85.5—89.0	45.8	73.6
89.5—94.0	48.7	64.3
94.0—98.0	48.5	85.5
98.0—103	45.5	91.5
103.0—111	47.8	84.6
111.0—115	55.2	59.2
115.0—118	56.4	54.8
118.0—122.5	55.9	56.4
122.5—128	53.0	85.0
128.0—134	53.8	81.8

*The calculation was made by means of coefficients (Translator's Note—Apparently by aniline points).

A high naphthenic concentration is observed in fractions 79—83° C., 98—103° C. 122—128° C., that is, fractions which should contain the simplest naphthenes with a six-membered ring. The quantity of hydrocarbons boiling at 85—90° C. is very small. This fraction may contain only 1,1-dimethylpentane and only small amounts of 1,2- and 1,3-dimethylcyclopentanes. A control distillation indicated that this fraction has a much wider range and that the above mentioned cyclopentane derivatives are either absent or present in only minute quantities.

Fraction 98—103° C., containing methylcyclohexane, as well as the following fraction 103—111° C., were obtained in largest amounts. These two fractions represent a total of about one-fourth of the charging stock.

The low yield of fractions 111—115° and 115—118° and control distillation indicated that 1,1,2—trimethylcyclopentane and its 1,2,4—isomer are either not present in Surakhan gasoline or contained in negligible quantities.

Beginning with fractions 118—120° C. to 128° C. the yield again increases. Low aniline points indicate the presence of considerable quantities of octanaphthenes, particularly dimethylcyclohexane.

Dehydrogenation Catalysis

After the preliminary determination of the composition of the gasoline by means of fractionation it was decided to convert the six-membered naphthenes into aromatics without further subdivision into smaller fractions. The catalyst was platinum deposited on charcoal.

Several test experiments were carried out to determine the optimum conditions. The reaction took place very rapidly at 330° C., but side reactions resulted in the formation of unsaturated hydrocarbons. When the working tem-

Joseph A. Moller, Pure Oil Co., Chicago, Ill., is one of the most active technologists in the development of extreme pressure lubricants and methods for testing the hypoid types of lubricants

perature was lowered to 300-310° C. these reactions appeared only in the beginning. (See Table 3.)

TABLE 3

Extent of Decomposition of Surakhan Gasoline Hydrocarbons at Different Dehydrogenation Temperatures

Boiling point of fraction, °C.	Dehydrogenation temp., °C.	Per cent Unsaturates formed (by iodine number)
122.5—128	314	1.1
122.5—128	330	1.2
118.0—122	305	1.8
118.0—122	330	5.2
79.0— 83	300	0.5
79.0— 83	315	0.9

It must be noted that one can almost always find a negligible quantity of unsaturates in gasoline when the determination is made by means of iodine numbers. This can probably be explained by substitution reactions of aromatic compounds.

The gasoline fractions were passed over the catalyst at the rate of 0.7-1.0 c.c. per minute until the refractive index of the product achieved a constant value. Three passes were generally required for complete dehydrogenation. The aniline points of the dehydrogenated fractions were determined and the products were treated with 98% sulfuric acid. The purified upper layer had the following constants: (See Table 4)

The fractions freed of aromatics were again passed over the dehydrogenation catalyst to prove that side reactions did not take place. No change in refraction was observed. The method cited in "Chemical Composition of Petroleum and Petroleum Products," edited by Sakhanov, was used to calculate the percentages of aromatics in the dehydrogenated fractions and also the percentages of naphthenes and paraffins after the aromatics have been removed. The results are shown in Table 5.

TABLE 5

Change in Composition After Dehydrogenation

Boiling point in °C.	Naphthenic content in % before catalysis	Aromatics in catalyzate in % calc. from refr. index	calc. from aniline pts.	Naphthenic content in % five-membered ring	six-membered ring
69.5- 74	55	..	7	45	10
74.0- 79	82	25	26	54	28
79.0- 83	90	..	51	39	51
83.0- 85.5	81	44	47	29	52
85.5- 89.5	85	32	37	43	42
89.5- 94	74	31	..	44	30
94.0- 98	74	39	43	27	47
98.0-103	83	60	..	17	66
103 -111	81	..	64	17	64
111 -115	65	41	46	22	43
115 -118	60	44	45	19	41
118 -122.5	66	43	49	20	46
122.5-128	74	63	64	15	59
128 -134	71	49	..	21	50
134 & higher	..	43	48	30	..

It must be noted that these figures are somewhat arbitrary, because the aniline points of pure compound taken from the literature were used in the calculation of the naphthenic content of the gasoline fractions. Aside from that, one had to account for the presence of other hydrocarbons in the given fractions.

The Quantity of Different Naphthenes Present in Surakhan Gasoline in Percent

Methylcyclopentane	6.5
Dimethylcyclopentanes	5.9
Ethylcyclopentane	5.1
Trimethylcyclopentanes	2.1
Propylcyclopentane	1.6
Cyclohexane	9.3
Methylcyclohexane	20.8
Dimethylcyclohexanes	7.9

It follows that despite all the relativity of the above data the six membered rings are present to a much greater extent than the five membered rings. Similar observations have been made by other investigators who studied the composition of straight-run gasolines from different fields.

The amount of five-membered naphthenes is sufficiently large but their concentration in certain fractions is less pronounced.

Paraffin hydrocarbons in Surakhan gasoline do not, apparently, play an important part, although they constitute about 40% of the gasoline. It is rather difficult to indicate which representatives of this class are present because the number of isomers in the fractions boiling below 100° C. is very large in comparison with the number of possible naphthenes.

On the basis of experiments using antimony pentachloride and other considerations, it has been concluded that both normal heptane and octane are almost entirely absent. The octane numbers of narrow cuts supply more evidence of this. The very high octane number of the Surakhan gasoline is not produced by naphthenic hydrocarbons, but as it has been shown by recent work of Lowell and Campbell[17], depends greatly upon the presence of branched aliphatic hydrocarbons. If the paraffins present consisted of a mixture of equal amounts of normal and isomeric compounds the octane number of the mixture would, in the best case, equal the octane number of naphthenes; that is, it would not exceed 60. In practice, the Surakhan gasoline has a very much higher octane number (74-78) which once more proves our supposition concerning the absence of normal paraffins.

Study of Octanaphthenic Fractions

After exhaustive dehydrogenation the starting fractions 118-122.5° C., 122.5-128°, and 128-134° were treated with excess 98% sulfuric acid. The lower layer, containing sulfonic acids, was separated from the unchanged hydrocarbons and diluted with water until the sulfuric acid concentration decreased to 30-35%. The sulfonic acids were subjected to hydrolysis at elevated temperatures. The extent of dilution was of little importance and its only effect was to change the initial boiling point of the xylenes.

The work of Kijner and Wendelstein[18] indicates that at temperatures up to 150° C. the hydrolysis of meta xylene sulfonic acid takes place almost exclusively; at 150-210° para xylene sulfonic acid begins to decompose while the corresponding ortho compounds is the most stable.

Our procedure was in accord with this investigation. The obtained xylenes distilled in the range 137-145° C. Fractions 136-137.5° C. and 137-140° C. were obtained by fractionation. Densities, refractive indices, and melting points were determined. (See Table 6)

The products obtained from fractions 118-122.5° and 128-134° C. do not differ as far as their boiling points are concerned, but the difference in their melting points allow us to assume that we are dealing with isomeric xylenes.

The mixture consists mostly of meta and para xylenes. The higher density and refractive index of the ortho compound make its presence improbable. Table 7 gives the physical constants of the pure xylenes as reported in the literature. The constants of the products obtained by a

TABLE 4

Physical Constants of Fractions

Boiling point, °C.	Before Dehydrogenation d_{15}	Before Dehydrogenation n_D^{20}	Before Dehydrogenation Aniline point	After Dehydrogenation n_D^{20}	After Dehydrogenation Aniline point	After 98% H_2SO_4 treatment d_{15}	After 98% H_2SO_4 treatment n_D^{20}	After 98% H_2SO_4 treatment Aniline point
70- 74	0.706	1.3939	51.2	1.3975	46.2	0.696	1.3880	51.2
74- 79	0.739	1.4045	42.7	1.4200	25.0	0.726	1.4010	47.1
79- 83	0.754	1.4080	41.5	1.4380	8.0	0.722	1.4080	52.8
83- 83.5	0.749	1.4110	46.5	1.4365	14.8	0.723	1.4002	57.8
85.5-89	0.750	1.4020	45.8	1.4283	22.9	0.722	1.4020	55.2
89- 94	0.756	1.4095	48.7	1.4300	....	0.731	1.4045	55.2
94- 98	0.748	1.4110	48.5	1.4330	17.0	0.733	1.4040	55.8
98-103	0.757	1.4178	45.5	1.4575	17.0	0.740	1.4081	57.0
103-111	0.760	1.4150	47.8	1.4550	-11.4	0.740	1.4054	57.0
111-115	0.753	1.4123	55.2	1.4380	21.8	0.740	1.4085	62.4
115-118	0.754	1.4145	56.4	1.4385	24.2	0.739	1.4090	62.4
118-122	0.756	1.4170	55.9	1.4430	19.2	0.745	1.4130	61.5
122-128	0.766	1.4200	53.0	1.4570	1.8	0.745	1.4112	61.8
128-134	0.773	1.4230	53.8	1.4530	9.8	0.759	1.4185	61.3
134 & above	....	1.4233	...	1.4470	22.0	0.757	1.4180	63.2

high temperature hydrolysis indicates the presence of the ortho compound as well.

Further investigation of the xylenes consisted in crystallization from an ether solution. Direct crystallization from the mixture was less effective. Some of the results are given in Table 8.

The crystalline material obtained from the original fraction 122-128° has a melting point which corresponds to the literature value for para xylene. Pure meta xylene has also been isolated at a lower temperature and the constants for this compound agree very well with those given in Table 7.

We have been unable to crystallize out pure orthoxylene. Similarly, all attempts to establish the presence of ethylbenzene among the sulfonic acids have been unsuccessful. Beyond 210° C. no distillate was obtained and, therefore, we could not raise the temperature of decomposition of the acids. Thus we conclude that the gasoline under investigation contained very little, or perhaps even no ethylcyclohexane.

To determine the quantity of meta and para xylene in the distillate obtained by hydrolysis of sulfonic acids we have extrapolated the data of Kijner and Wendelstein to apply for lower temperatures. As a result we have determined the presence of approximately 74% meta dimethylcyclohexane in the naphthenic fraction of the gasoline boiling at 118-122.5°, while fractions 122-128° C. and 128-134° C. contained 86% and 88% of this compound or its isomers. Although these figures are rather approximate, there is no doubt that 1,3-dimethylcyclohexane is the major constituent.

TABLE 6

Properties of Xylenes Obtained by Hydrolysis of Sulfonic Acids

Original fraction from which xylene was obtained	B. P., °C. of xylene mixture	Yield in %	n_D^{20}	d_{15}^{15}	Freezing point in °C.
118.0-122.5°C.	136-137	50	1.4970	0.867	—29
	137-145	40	1.4975	0.868	—29
122.5-128°	136-137	30	1.4970	0.869	—49
	137-140	17	1.4972	0.870	—54
	135-137[1]	17	1.4974	0.873	—15.5
	137-140	21	1.4985	0.872	—16.5
	137-139[2]	15		0.872	—19.5
128-134°	137-140	55	1.4962	0.873	—40
	140-145	45	1.4970	0.874	—43.5

[1] Obtained by hydrolysis at 150°-180°C.
[2] Obtained by hydrolysis at 180-201°C.

An example of the best in refinery construction for the smaller type of refinery. Courtesy Gulf Refining Co.

TABLE 7

Physical Constants of Chemically Pure Xylenes

Name	Boiling pt., °C.	n_D^{20}	d_{15}^{15}	Freezing pt., °C.
Ortho xylene	144	1.5058	0.885	—27
Meta xylene	138.8	1.4973	0.869	—54
Para xylene	138	1.4956	0.866	+13

TABLE 8

Physical Constants of Xylenes Obtained by Crystallization from Ether

Original fraction from which xylene was obtained	Freezing point of xylene in °C.	n_D^{20}	d_{15}^{15}
122-128°C.	+13	1.4970	....
122-128	—27	1.4985	....
122-128	—54.5	1.4972	0.870
127-134	+12	1.4970	....
127-134	—50	1.4980	....

TABLE 9

Action of $SbCl_5$ Upon a Mixture of Cyclohexane, Normal Heptane and 2, 2, 4—Trimethylpentane

		Before reaction		After reaction	
C. C. of hydrocarbon mixture	C. C. of $SbCl_5$ added	Aniline point	n_D^{20}	Aniline point	n_D^{20}
11.5	7.5	60.9°C.	1.3945	59.2	1.3900
12	10	60.9	1.3945	55.5	1.3935
12	7.5	60.9	1.3945	55.7	1.3935
12	10	60.9	1.3945	56.7	1.3935

Study of the Action of Antimony Pentachloride Upon Hydrocarbons

The problem of investigating the hydrocarbons which are not affected by dehydrogenation catalysis is a much more difficult problem than the one faced in the first part of our study. As it was pointed out above, we have decided to use the $SbCl_5$ reaction, which, according to Schaarschmidt, removes hydrocarbons containing tertiary hydrogen atoms.

Synthetic mixtures of normal heptane, cyclohexane and 2,2,4-trimethylpentane were used to determine the conditions and determine the extent of reaction. Antimony pentachloride was prepared by passing a rapid stream of chlorine over metallic antimony. The product almost always contained some antimony trichloride which can be removed by cooling to 0° C. and not by distillation. A small amount of the trichloride has no effect upon the reaction and may be left in the solution.

Cyclohexane and Normal Heptane

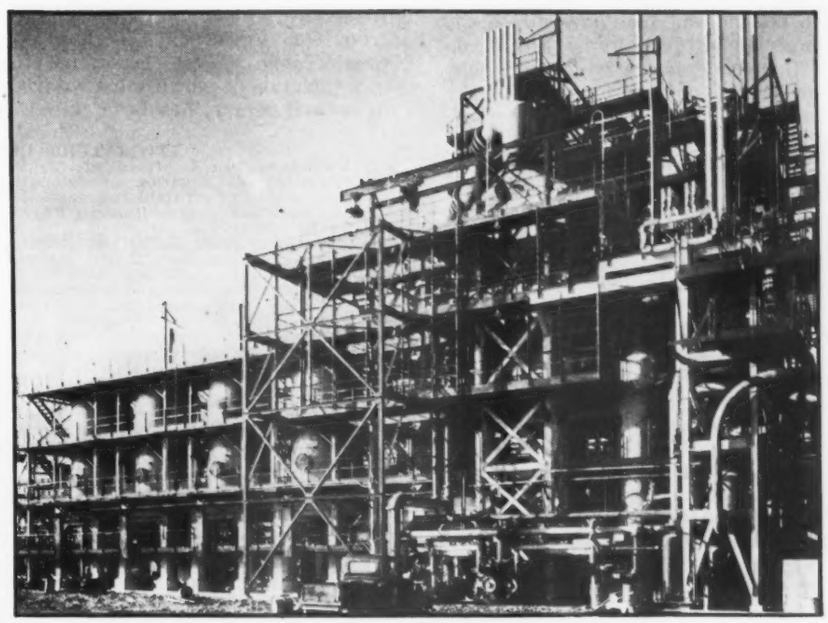
Both cyclohexane and normal heptane were synthesized, their constants were checked, and a mixture of 10% C_6H_{11} and 90% C_7H_{16} was prepared. $SbCl_5$ was poured into this mixture at 35° C.; no violent reaction was observed even at this high temperature, and, although there was some residue at the bottom of the container, the constants of the hydrocarbon mixture remained unchanged.

Methylcyclohexane and Normal Heptane

A mixture of 10% methylcyclohexane and 90% normal heptane was treated with $SbCl_5$ at room temperature. A violent reaction took place immediately. The unchanged hydrocarbon had an aniline point of 69.6° C. which corresponded to that of normal heptane used in the mixture. Thus, methylcyclohexane was entirely removed under the above conditions.

Normal Heptane, Cyclohexane and 2,2,4-Trimethylpentane

The mixtures prepared for test purposes consisted of 20% cyclohexane and 80% normal heptane to which 2,2,4-trimethylpentane was added in quantities varying from 18 to 35%. The ratio of $SbCl_5$ to hydrocarbon treated was also varied. Aniline point and refractive indices were determined prior to the addition of 2,2,4-trimethylpentane. The data obtained are shown in Table 9, and, as it can be seen, the physical constants of products from different experiments fluctuate considerably. This may be due to the following: (1) simultaneous removal of normal heptane and cyclohexane; (2) formation of chlorinated products, remaining in the hydrocarbon mixture; (3) isomerization of hydrocarbons. Although the last reaction has not been reported in the literature, there is sufficient information on isomerization using $AlCl_3$ as the catalyst. A great similarity in the action of antimony and aluminum chlorides



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In 1935 another cracking unit was started at the same plant and additional Gray clay towers specified.

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allows us to suppose that a six-membered ring may isomerize into a five-membered one". An investigation of this reaction using $SbCl_5$ presented serious difficulties.

Large losses of the hydrocarbon following a $SbCl_5$ treatment (the product generally did not exceed 50% of the starting material) tend to indicate that, in at least its present form, this method of separating hydrocarbons is rather unsatisfactory. Similar results were obtained when we tried to purify practical hexane (from Kahlbaum). This compound was obtained from petroleum and contained, according to the aniline point, about 35% naphthenes.

It is very difficult to control the reaction with $SbCl_5$ even though identical experimental conditions are used. However, in a number of experiments we have been able to raise the concentration of the normal hydrocarbon in the final product, and it appears possible that this method is better for the separation of normal hydrocarbons from naphthenic fractions than that using chlorosulfonic acid.

It has been found best to add $SbCl_5$ to the hydrocarbon gradually, otherwise the temperature cannot be controlled. After each addition it is necessary to wait until the evolution of HCl has ceased before adding more $SbCl_5$. The reaction is difficult to start but once started it proceeds rather rapidly. From time to time it is necessary to interrupt the reaction and remove the products. Table 10 shows the process of purifying practical hexane. Maximum purity is obtained when the reaction proceeds very rapidly, independent of the fact whether this is caused by a higher working temperature or an uninterrupted addition of $SbCl_5$ or too large an amount of the latter. It has been observed that the addition of two molecules of $SbCl_5$ to each hydrocarbon molecule is not sufficient—at least three $SbCl_5$ molecules are required. The yield of pure hexane with an aniline point of 69.1-69.2 was always very low.

On the basis of our experiments we have adopted the following procedure. $SbCl_5$ was added to the hydrocarbon at room temperature in fractions of 5-10 c.c. to prevent a vigorous evolution of hydrogen chloride. After a sufficient quantity of the reactant has been added the lower layer was quickly separated since the complex compounds which are formed sometimes solidify on standing. The hydrocarbon layer was washed with hydrochloric acid, 98% sulfuric acid, alkali and water. Then it was dried and distilled over metallic sodium.

The application of this method to the 98-103° C. fraction of Surakhan gasoline from which six-membered rings have been removed by dehydrogenation and sulfonation, gave the following results:

Analogous treatment of fraction 79-83° C. changed the aniline point from 52.8 to 66.6 and the refractive index from 1.4080 to 1.3890. In all probability methylcyclopentane was removed thus increasing the concentration of 2,2-dimethylpentane which boils at 78.9° C.

An attempt was made to isolate normal octane from the fraction boiling at 125° C. After dehydrogenation and sulfonation the boiling range shifted considerably. Most of the liquid distilled up to 120° C., while only 17% were obtained in the range 122-128° C. Using a higher boiling fraction only 25% of the product distilled at about 125° C. After the reaction with $SbCl_5$ the aniline point increased from 60.5 to 64.5, the boiling point, however, increased considerably. These preliminary data indicate that the concentration of paraffin hydrocarbons, having little relation to normal octane, has been raised.

* * *

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Heads Testing Methods Committee

K. G. Mackenzie, The Texas Co., New York, will serve as 1938 chairman of the American Petroleum Institute's committee on testing methods and specifications. Appointment was made by N. E. Loomis, chairman of the central committee on refinery technology. Committee membership totals 35 including the chairman. R. P. Anderson, secretary of the Division of Refining, will be secretary of the committee.

John S. Hess, Sinclair Refining Co., New York, has been named chairman of the 1938 committee on disposal of refinery wastes. D. V. Stroop, institute staff engineer, will serve as secretary.

J. Bennett Hill, Sun Oil Co., Marcus Hook, has been appointed chairman of the 1938 program committee of the Division of Refining.

TABLE 10

The Action of Antimony Pentachloride on the Hexane Fraction, Obtained from Petroleum, with an Aniline Point of 57° C.

Expt. No.	C. c. of technical hexane	C. c. of $SbCl_5$ added at a time	Total amt. of $SbCl_5$ added	Length of experiment in hrs.	Temp. °C.	Yield in %	Aniline point, °C.	n_D^{20}
1	200	5	100	18	0	75	62.4	.....
		5	55	..	..	44	66.4	.....
		5	25	..	..	25	69.1	1.3880
		Total	180					
2	200	5	100	18	30	70	63.0	.....
		5	45	..	..	34	67.0	1.3910
		5	25	..	..	16	69.3	1.3875
		Total	170					
3	200	20	100	12	0	73	62.4	.....
		20	50	..	..	27	67.4	1.3898
		Total	150					
4	200	10	30	12	0	83	59.4	1.3994
		10	30	..	..	64	61.3	1.3986
		10	30	..	..	51	61.6	1.3960
		10	30	..	..	35	...	.....
		Total	120					
5	100	10	66	12	15	67	63.1	.....
		10	30	..	..	30	67.8	.....
		10	10	..	..	9	69.2	.....
		Total	106					

the aniline point increased from 56.7 to 62° C., and the coefficient of refraction fell from 1.4075 to 1.4030. This marked change allows us to suppose that the given fraction contains a paraffin hydrocarbon which is stable to $SbCl_5$. This may be normal heptane or 2,2,3,3-tetramethylbutane. Lack of material prevented further purification of this fraction.

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Acid and Reactive Colloid For Water Treatment

By L. D. BETZ*

Abstract

Cost of treating a refinery water containing, among other ions, 134 parts per million of calcium, along with other dissolved materials, is rated at 3.23 cents per 1000 gallons water treated. This is considerably lower than the estimated costs for some other methods as quoted in this article.

Installation costs for the acid-colloid treatment are also quite low when compared to some older treating methods, being less than $1000 for feeding equipment in the case discussed, compared to several thousand dollars for more elaborate processes. Figures and estimates are for specific case presented. Water treatment problems must be solved individually, after study of the water used and individual conditions involved, author says.

IMPURITIES found in water divide themselves into two main classes, namely — suspended solids and dissolved solids. Suspended solids are those substances which can be removed by filtration, while dissolved solids are those substances which are in solution and thus readily pass through filters. Suspended solids lend themselves for the most part to easy removal, hence most of the difficulties encountered in plant practice, will be found to be due, mainly to the presence of dissolved solids. Figure II shows those substances which are usually found in water, their principle source, and the difficulties they cause upon evaporation.

Because of the wide variation of these salts and their influence on the character of the water, it very clearly points to the necessity for chemical control. A careful inspection of this list, shows the major difficulties encountered through impurities in water are scale formation, corrosion, and a foaming or priming condition when used for boiler purposes.

Scale deposition itself is of prime importance, because of its effect in reducing heat transfer, as illustrated in Fig. 1. Scale deposition retards heat transfer, regardless of whether it is on the evaporative surface, or whether it is on a surface used for cooling purposes.

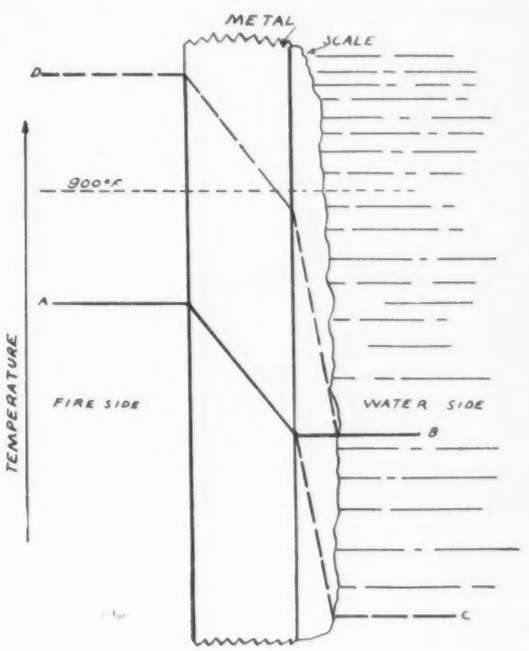

Fig. 1. Diagrammatic illustration of how scale reduces boiler heat input rate and reduces steam generation rate

*W. H. & L. D. Betz, Inc.

TABLE 1

Common Impurities in Water and Possible Effect When Used for Boiler Feed Purposes

Constituent	Chemical Formula	Principal Source	Possible Effect When Present in Boiler Waters
Suspended Solids	.....	Surface Drainage Trade Waste	Priming, foaming, sludge or scale.
Silica	$Si O_2$	Mineral Deposits	Scale
Calcium carbonate	$CaCO_3$	Mineral Deposits	Scale
Calcium bicarbonate	$Ca (H CO_3)_2$	Mineral Deposits	Scale
Calcium sulphate	$Ca SO_4$	Mineral Deposits	Scale, corrosion
Calcium chloride	$Ca Cl_2$	Mineral Deposits	Scale
Magnesium carbonate	$Mg CO_3$	Mineral Deposits	Scale
Magnesium bicarbonate	$Mg (H CO_3)_2$	Mineral Deposits	Scale
Magnesium chloride	$Mg Cl_2$	Mineral Deposits	Scale, corrosion
Free acids	$H Cl, H_2 SO_4$	Mine drainage Trade waste	Corrosion
Sodium Chloride	Na Cl	Sewage, trade waste mineral deposits	Inert, but may be corrosive under some conditions.
Sodium carbonate	$Na_2 CO_3$	Mineral deposits	Priming, foaming, embrittlement
Sodium bicarbonate	$Na H CO_3$	Mineral deposits	Priming, foaming, embrittlement
Carbonic acid	H_2CO_3	Absorption from air mineral deposits and decomposition of organic matter.	
Oxygen	O_2	Absorption from air	Corrosion
Grease and oil	.....	Trade waste	Corrosion, deposits, foaming, priming.
Organic matter and sewage	.....	Domestic and trade wastes	Corrosion, deposits, foaming, priming.

From "Boiler Feed Water Purification" by S. T. Powell

Corrosion is due mainly to the presence of substances of an acidic character or oxygen and carbon dioxide in appreciable amounts. The action of these substances is to place the metal in solution.

Foaming and priming tendencies encountered in boiler operations are due mainly to the presence of suspended solids, high alkalinities and the conditions under which the boiler is operating. It is a known fact that ratings and pressures have a decided effect upon the tendency of any given boiler, to prime or foam.

Many methods for dealing with the presence of salts in solution in water, have been proposed, the major portion of which are based entirely upon various chemical reactions. Time does not permit a detailed discussion of all of these various methods, but briefly they are divided into two main classifications; those referred to as external methods of treatment and those referred to as internal methods.

Among the former, are the lime-soda and Zeolite methods of treatment while among the latter, are the use of numerous chemicals, including silicate of soda, phosphates, sodium aluminate, various organic substances and various types of colloidal substances.

Much has been said and numerous articles written on the subject of water for boiler feed purposes. While this is a problem of major importance, in the petroleum industry, the problem of water for cooling purposes, has not received as great attention. Time being limited, I would like to discuss the subject of the treatment of water for cooling purposes in detail, as less has been offered on this particular phase of water treatment. Needless to say — any treatment offered for one purpose, must take into consideration, requisites for the other, for in practically all instances, boiler feed water is procured from the same source as the cooling water and if any treatment given to the one supply, can be made adaptable for both purposes, it is of decided advantage.

There appeared recently an article entitled "Acid Treatment for Cooling Water to Prevent Scale Formation".[1] In concluding this article, the author states "In conclusion, we do not recommend the use of sulfuric acid treatment for the reasons noted. If sulfuric acid treatment is used in spite of these factors, it should only be applied under rigid control with a competent chemist in the vicinity". You will notice in this statement, the author makes no exception to this rule. He simply states that sulfuric acid treatment is not recommended to be used under any condition and gives warning of the necessity of having a competent chemist in the vicinity, if such treatment is used "in spite" of these factors.

It has been our experience in working with waters found in the Oklahoma, Kansas and Texas sections, that specific study need be applied to each problem individually and it is our experience that no such far-reaching statements can be made to the effect that any one method is either suited or unsuited to the general treatment of water for cooling or any other use.

There are three main methods that can be applied to the treatment of these waters with varying degrees of success and in giving them consideration one must take into cognizance not only the possible results to be achieved, but the capital expenditure which might be necessary in the way of equipment, must likewise be given equal consideration. The three chief methods which can be employed in treatment of water of this character to make them suitable for use as cooling water and prevent scale formation, are:

1—Sulfuric acid and aeration.
2—Lime treatment, possibly coupled with soda ash.
3—Zeolite treatment.

As a particular example, it has recently been our privilege to make a very comprehensive study of the cooling water problem at the plant of a large oil refinery in Kansas. It is interesting to note some of the facts disclosed as the result of this study. It is my opinion that the best answer, as to the choice of treatment that should be given any water, can only be determined by a detailed study of this character and to carefully choose which of the three methods outlined above, might best be suited to a solution of the problem itself.

To begin with, the raw water supply at this plant, contained solids in very high concentrations. The water was obtained from two sources and was mixed. Table I will show the average analysis of the raw water taken from monthly composite samples. These analyses cover a full year's operation and also include maximum, minimum and average amounts of the various constituents.

It will be noted that this water is one that is high in natural alkalinity, containing large amounts of calcium bicarbonate, which under the action of heat will break down, liberating free carbon dioxide gas and precipitating calcium carbonate from solution, forming a heavy scale on the cooling system. This action, causes difficulty in the various heat exchanger units and considerable trouble was being experienced at the plant in question. A composite sample was made of several portions of the deposit formed, the analysis of which is shown in Table 2.

TABLE 3

Calcium oxide as CaO	49.79
Magnesium oxide as MgO	2.24
Iron & Aluminum oxide as R_2O_3	0.82
Organic matter & coal oil	6.05
Carbon dioxide as CO_2	39.00
Sulfur trioxide as SO_3	1.29
Silica as SiO_2	0.15
Thickness—½" to 3"	

A study of the complete system reveals the distribution of water in accordance with Table 4.

TABLE 4
Cooling Water Distribution

Water returned to pond through sprays	8,800 g.p.m.	(130°F.)
Loss of water through spraying (Evaporation and Windage	880 g.p.m.	(calc. as 10%)
Net water returned to pond by sprays 8,800 — 880 =	7,920 g.p.m.	(98°F.)
Make up from wells and mine 540 + 350 + 800	1,690 g.p.m.	(65°F.)
Water to cooling service	8,420 g.p.m.	(96°F.)
Water to other service (Incl. B. Hse.)	370 g.p.m.	(96°F.)
Water to sewer, ditches, losses	680 g.p.m.	(130°F.)
Total water to refinery (8,420 + 370 + 680) =	9,470 g.p.m.	(96°F.)
Water not accounted for—other losses (9,470 — 8,880) =	670 g.p.m.	

An inspection of the pump log, was made, showing

[1] O. & G. Jr. Jan. 13, 1938, p. 46.

TABLE 2
ANALYSIS OF RAW—WATER (monthly composite samples)
Boiler Feed Water Untreated
November 1935 to November 1936

	Nov. 1935	Dec. 1935	Jan. 1936	Feb. 1936	Mar. 1936	Apr. 1936	May 1936	June 1936	July 1936	Aug. 1936	Sept. 1936	Oct. 1936	Max. 1936	Min. 1936	Avg. 1936
Silica	14	13	14	21	15	16	13	16	19	16	18	14	21	13	16
Iron Oxide) Alumina)	2	2	2	7	9	3	4	6	3	2	10	5	10	2	5
Calcium	113	118	128	137	125	133	128	116	158	179	138	132	179	113	134
Magnesium	28	30	30	32	31	34	28	30	34	39	36	16	39	16	31
Sodium	381	392	390	405	437	493	479	335	315	363	439	426	493	315	405
Bicarbonate	239	248	253	283	259	253	244	232	249	241	216	187	283	187	242
Carbonate															
Chloride	627	644	651	644	710	813	763	474	483	658	663	636	813	474	649
Hydroxide															
Sulfate	143	150	160	179	170	182	191	272	321	360	321	260	360	143	217
Volatile & Organic Matter)	51	53	50	50	50	50	56	30	34	20	20	20	56	20	40
Total Solids by Analysis)	1,599	1,649	1,678	1,778	1,806	1,977	1,906	1,511	1,616	1,778	1,861	1,696	1,977	1,511	1,738
Total Solids by Evaporation)	1,432	1,595	1,590	1,606	1,688	1,841	1,816	1,385	1,531	1,734	1,805	1,692	1,841	1,385	1,643
Hardness at $CaCO_3$	400	415	443	474	440	472	435	413	534	607	493	396	607	396	460

All Values Reported In Parts Per Million

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TABLE 5

Daily Average of Cooling Water in 1000 Gallons

Received From and Delivered To Pond	January	February	March	April	May	June	July	August	September	October
Topping	8,700	9,000	7,550	8,180	8,580	8,900	9,100	9,140	8,900	8,880
Dubbs—E to H	185	500	400	554	580	628	377	410	330	374
Dubbs—J to M	415	500	519	677	586	618	410	462	374	457
Total From Stills	9,300	10,000	8,469	9,411	9,746	10,146	9,887	10,012	9,604	9,711
Wells	715	800	1,286	1,200	790	636	1,180	1,130	1,230	1,210
Mine	1,800	1,800	1,144	1,150	1,060	1,150	1,130	1,150	1,150	1,184
	11,815	12,600	10,899	11,761	11,596	11,932	12,197	12,292	11,984	12,105
Taken From Pond and Pumped To										
Topping	9,160	9,400	8,380	9,100	9,020	9,330	9,580	9,620	9,040	9,320
Dubbs—E to H	800	800	687	800	800	800	800	800	800	800
Dubbs—J to M	915	895	893	964	800	796	867	918	910	980
Stabilizer No. 2	350	350	328	350	350	350	350	350	350	350
Total To Cooling	11,225	11,445	10,288	11,214	10,970	11,276	11,597	11,688	11,100	11,450
Boiler House	300	300	300	300	300	300	300	300	300	300
Waste	300	300	300	300	300	300	300	300	300	300
	11,825	**12,045**	**10,888**	11,814	11,570	11,876	12,197	12,288	11,700	12,050

the volume of water pumped to and received from the various departments. This information is summarized and shown in Table 5. This covers operations for a ten months' period and is representative of an average condition.

Average temperatures of the spray pond and the returns from the various cooling units were found to be in accordance with Table 6, readings taken during 1936.

TABLE 6

Average Temperature of Spray Pond and Returns

Minimum No. in
January—temp. water being returned to pond 90°F. temp. of pond 73°F.
March—temp. water being returned to pond 100°F. temp. of pond 75°F.
April—temp. water being returned to pond 108°F. temp. of pond 83°F.
July—temp. water being returned to pond 118°F. temp of pond 95°F.
Maximum No. in
August—temp. water being returned to pond 123°F. temp of pond 97°F.
November—temp. water being returned to pond 105°F. temp. of pond 78°F.

Practically 70 per cent of the cooling water was delivered to the topping still. The temperature of the returned water was observed to be a minimum of 100° F. and a maximum of 135° F. The cooling water, which was returned to the spray pond from the Dubbs unit was found to occasionally reach the temperature of 180° F. No evidence of corrosion has ever been noted in any of the lines, although some slight attack of some of the valves in the cooling water line did indicate the presence of some active corrosion. Considerable carbonate scale was reported as being deposited in the lines, returning from the Dubbs unit to the spray pond and was found present for a distance of about 200 feet from the Dubbs unit towards the pond. It was found impossible to increase the volume of water flowing through these coils in order to lower the temperature below that of 180° F. Frequent inspections of the open condensers were required and maintenance costs were quite high, due to the necessity for periodic cleanings. The vapor cooled by the condensers had a temperature of approximately 530 to 560° F., as an average. Table 7 shows the volumes of water delivered for various cooling purposes, together with the temperature rise and the approximate heat load.

TABLE 7

Cooling Water Heat Load

Unit	Approx. Water Consumption, g.p.m.	Approx. Temp. Rise	Approx. Heat Load B.t.u./hr.
Topping No. A	1,000	30	15,000,000
Topping No. B	1,590	30	24,000,000
Topping No. C	1,590	30	24,000,000
Topping No. D	1,830	26	24,000,000
Topping Total	6,010	Aver. 29	87,000,000
Dubbs No. E	100	80	4,000,000
Dubbs No. F Dubbs	175	80	7,000,000
Dubbs No. G	325	40	6,500,000
Dubbs No. H—E to H	510	35	9,000,000
Dubbs No. J	100	80	4,000,000
Dubbs No. K Dubbs	100	80	4,000,000
Dubbs No. L	100	80	4,000,000
Dubbs No. M—J to M	100	Aver. 80	4,000,000
Cracking Total	1,510	Aver. 56	42,500,000
Recovery Plant			
Stabilizer No.	230	22	2,500,000
Gas System	430	30	6,500,000
			9,000,000
Total (Processing Units)	8,420 g.p.m.	Aver. 33	138,500,000

A study of the conditions clearly indicates that the existing difficulties experienced with this water, were a result of the break-down of calcium bicarbonate, under the temperature encountered in the condenser, this break-down taking place in accordance with reaction 1, in Table 8.

(1) $Ca(HCO_3)_2 + \triangle = CaCO_3 + H_2O + CO_2$

(2) $Ca(HCO_3)_2 + H_2SO_4 = CaSO_4 + 2CO_2 + 2H_2O$

(3) $Ca(HCO_3)_2 + Na_2Z = 2NaHCO_3 + CaZ$

(4) $Ca(HCO_3)_2 + Ca(OH)_2 = 2CaCO_3 + 2H_2O$

In order to prevent such a break-down as this, it is necessary to either eliminate the bicarbonate ions, the calcium ions, or both, and at the same time, to refrain from introducing any material that would in itself deposit or permit deposits of other impurities to form from solution. A study of the best possible method indicates that any one of these three approaches to the problem might be employed and the final solution to the problem will be dictated by the economics as well as the results that are likely to be obtained from the treatment in question. The bicarbonate ions can be eliminated through the introduction of a mineral acid, the cheapest of which is sulfuric acid. The reaction taking place under this form of treatment is in accordance with reaction (2) in Table 8. The calcium ions as well as the magnesium ions can be eliminated by Zeolite treatment through the medium of base exchange, the calcium and magnesium being replaced by sodium, in the base exchange process. This is illustrated in reaction (3) in the table.

Both the calcium and bicarbonate ions can also be eliminated by lime treatment, resulting in the precipitation of calcium carbonate which takes place in accordance with reaction (4) in the table.

In giving consideration to the adoption of any particular method, it is necessary to carefully consider the resulting products of the reaction as well as the concentrations that will result under the proposed system. It is always safe to consider the concentrations considerably higher than actually experienced and to introduce this as a safety factor. Furthermore, any proposed treatment must not overlook the possibility of increased corrosive action and should also provide a preventative measure to eliminate the possibility of any interlocking of crystalline deposits which might result.

Acid Treatment

In the reaction ensuing from the introduction of sulfuric acid, the bicarbonate ion is destroyed and replaced with the sulfate ion, carbon dioxide being liberated in the process. Calcium sulfate being far more soluble than calcium carbonate, greater concentrations of this product can be carried without experiencing difficulty from the product being thrown out of solution and deposited upon heat exchange surfaces.

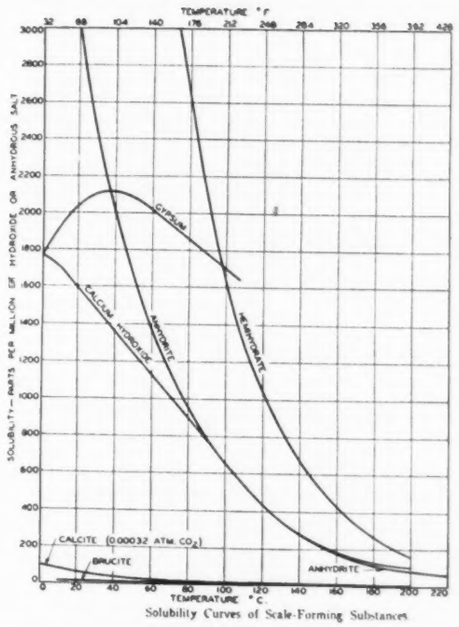

Fig. 2. Comparative solubilities of different forms of calcium sulfate and calcium carbonate, including CaO and the gypsum, anhydrite, and hemihydrate forms

Fig. 2 illustrates the comparative solubility of the various crystalline forms of calcium sulfate and calcium carbonate. It is readily apparent that all forms of calcium sulfate possess far greater solubility than any form of calcium carbonate.

For acid treatment to be successful, it is necessary that opportunity be afforded for the release of the carbon dioxide liberated in this reaction and a small aeration chamber should therefore be provided for this purpose. Fig. 3, illustrates a typical flow sheet, of an acid treating system of this character.

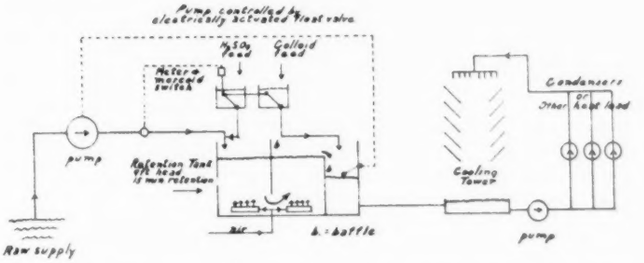

Fig. 3. Sulfuric acid-aeration-reactive colloid system for treating boiler waters

It would not be desirable to eliminate all of the bicarbonate content as the excess acid over and above that which might be necessary to release the calcium bicarbonate would result in a sharp drop in the pH Value, giving rise to the opportunity for corrosion. In the case in hand, sufficient sulfuric acid should be added to leave an average alkalinity of the make-up water, of 40 p.p.m. expressed as calcium carbonate. The present average alkalinity, expressed as calcium carbonate, is equivalent to 200 p.p.m. and would require sufficient acid to neutralize 160 p.p.m. of alkalinity. This would require 160 p.p.m. of sulfuric acid equivalent to 1.3 lbs. of commercial acid, per thousand gallons of make-up water introduced. To avoid some of the complexities of the entire system, the figures which follow are all based on one particular unit of the described system, namely — the treatment of 720,000 gallons of make-up water per day, equivalent to 500 gallons per minute. To deal with this quantity of make-up water, 960 lbs. of acid would be required per day.

Figuring a cost of 1c per lb. for the acid, the total cost would be $9.60 per day, or 1.3c per thousand

THE advantages of the Sharples Centrifugal Acid Treating Process when treating with Fuming Acid are too important to neglect. Very real savings in oil and acid are not all. Time is greatly reduced. Accurate temperature control is easy. So is change-over to different stocks. Sulphur dioxide control is much simplified by the compactness of the equipment.

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TABLE 9
Composite Raw Water

	Max.	Min.	Aver.	A	B	C	D
Silica (SiO_2)	21	13	16	16	16	16	40
Iron and Aluminum Oxide (R_2O_3)	10	2	5	...	...	...	...
Calcium (Ca)	179	113	134	134	54	0	335
Magnesium (Mg)	39	16	31	31	31	0	77
Sodium (Na)	493	315	405	405	405	617	1,012
Bicarbonate (HCO_3)	283	187	242	49	0	49	123
Carbonate (CO_3)	0	0	0	0	0	0	0
Hydrate (OH)	0	0	0	0	0	0	0
Chloride (Cl)	813	474	649	649	649	649	1,620
Sulfates (SO_4)	360	143	217	370	217	217	925
Volatile and Organic Matter	56	20	40	...	...	...	...
Hardness as ($CaCO_3$)	607	396	460	460	264	0	1,150

A—Expected analysis after sulfuric acid treatment.
B—Expected analysis after lime treatment. (see text).
C—Expected analysis after zeolite treatment.
D—Expected analysis of circulated water, acid treated, under normal concentrations in the system.

Results in p.p.m.

gallons of make-up water. The acid should be fed to the make-up water proportionately and a proportional type of feeder, actuated by a line meter can be procured for an investment cost of approximately $250.00 to $275.00.

Table 9 will illustrate the changes in the chemical composition that will be effected by the acid treatment and will also show concentrations to be expected in the circulating system under this method of control. Calculating all of the calcium ions present as calcium sulfate, it is found to be equivalent to a total of 1140 p.p.m. in the circulating water. As the solubility of calcium sulfate, under the temperatures experienced in these units, is approximately 1700 p.p.m., there would be little tendency for calcium sulfate to deposit. Calculating the silica concentration to calcium silicate, we arrive at an equivalent of 61 p.p.m. the solubility of which, at the temperatures encountered, is approximately 90 p.p.m. again allowing an ample factor of safety. It is at once apparent, however, that it would not be possible to concentrate the water in the unit much higher than indicated, without some softening action. Magnesium silicate is quite insoluble, and there will be some tendency for this to deposit from solution, unless some steps are taken to prevent such deposition. Dissolved oxygen would also be present to some extent, which would also have a tendency to promote corrosion, unless some steps were taken for subsequent treatment. Some residual alkalinity must also be carried. This is provided for to the extent of 123 p.p.m. There would still be some tendency for this residual alkalinity to break down, unless an inhibiting agent were present.

For the subsequent treatment of this water, reactive organic colloids can be employed, to prevent such action and should be fed to the system at the rate of 0.1 lb. per thousand gallons of make-up water introduced. These colloids will serve to disperse any calcium that might have a tendency to leave solution and prevent the interlocking of any crystals so formed in the heating unit. The colloids can be fed by a proportioning device similar to that used for the acid, merely by making an extension of the electromagnetic proportioner. The feed of the colloids, however, should be to the effluent water from the aeration chamber and into the surge tank going directly to the heating load. The equipment required for such proportional feeding, will not amount to any more than $100.00 additional, making the total cost of feeding equipment approximately $350.00 to $375.00.

Through the introduction of the organic reactive colloids, there will actually be a reduction in the hardness content of the circulating water as well as some reduction in the silica content, resulting in the formation of dispersed colloidal gel. The total cost per thousand gallons of make-up water treated under this system, will be 3.23c per thousand gallons.

Consider next the effects on this water by lime pretreatment, results to be expected, the cost of treatment and the cost of equipment. The precipitation of calcium carbonate, resulting by the addition of lime, requires 80 p.p.m. of hydrated lime, for each 100 p.p.m. of carbonate hardness. For the water under consideration, this would theoretically require 1.33 lbs. per thousand gallons. These calculations have been made from a theoretical standpoint to illustrate the principle involved and do not represent the quantities that would be actually required in practice. The analysis shown for the lime treated water in Table 9, is also entirely from a theoretical standpoint, as it is based on complete precipitation of the carbonate hardness with no allowance for the precipitation of the magnesium content. It is impossible to treat, in practice, water for the removal of carbonate hardness alone, without also removing a portion of the magnesium and in addition, it is necessary to employ excess quantities over and above theoretical, to force reactions to completion. The following figures are therefore lower than can actually be obtained in practice.

Calculating hydrated lime at approximately 1c per lb. we arrive at a chemical cost of 1.33c per thousand gallons for the lime alone. To aid in the coagulation and settling of the precipitate, 0.125 lbs. of sodium aluminate should be added, per thousand gallons, which at a cost of 7c per lb. gives an additional chemical cost of 0.87c per thousand gallons. Allowing four hours settling time, a tank of 120,000 gallons capacity would be required. In addition to this, two filters — eight feet diameter by twelve feet long (horizontal type) would be required to give a total filtering area of 180 sq. ft. In addition to this, a subsequent treatment of reactive colloids would still be required in exactly the same quantities equivalent to those required under the acid treatment to prevent further precipitation from solution of the residual calcium carbonate as the solubility of this salt decreases with increase in temperature. The total cost of treatment under this system, would be 4.10c per thousand gallons of make-up water, considerably higher than the cost of acid treatment, as outlined previously. In addition to this, a large capital expenditure would be required for the settling tank and filters. It is plainly evident that this method cannot compete on an economic basis with the acid treatment, described previously.

Zeolite Treatment

In considering the treatment of this water with zeolites, we must first take into consideration the average hardness of 460 p.p.m. equivalent to 27 grains per gallon. Considering either the natural or artificial zeolites, 0.5 lbs. of sodium chloride is required per grain of hardness, per thousand gallons of water to be softened. With a water of 27 grain hardness, 13.5 lbs. of salt would be required for each thousand gallons treated. With a salt cost of approximately $12.00 per ton, equivalent to 0.6c per lb., the salt cost alone on this water would be 8.1c per thousand gallons and on the treatment of 720,000 gallons per day of make-up water, would amount to $58.20 per day.

Estimating one regeneration per day, the zeolite capacity would be 720,000 times 27 grains or 19,500,000 grains of hardness and figuring on green sand at 2700 grains per cu. ft. would require 7200 cu. ft. of green sand, which at $4.00 per cu. ft. would entail a cost of $28,800.00 for the green sand alone.

It is doubtful that this water could be treated by means of a zeolite softener without pre-filtration. Such

equipment for filtration and the zeolite unit itself, excluding the cost of the green sand, would involve an additional expenditure of from $7,000.00 to $10,000.00, making a total capital investment of between $36,000.00 to $39,000.00. Inasmuch as the salt cost alone is more than twice the total cost under the acid treatment, to say nothing of the investment required for equipment, the zeolite method of treating the water in this particular case, can be dismissed from consideration. Please understand that we are considering in this instance, only the water in question and it is highly probable that in other waters, where the character differs from the example in question, that zeolite treatment may prove the one most economical to use.

Other combinations, such as primary lime and secondary zeolite can also be given consideration, but inasmuch as both the lime and zeolite treatment are more expensive than the plain acid treatment, and both require considerable capital expenditures, such combination in this particular instance, would not result in any effective savings over that of straight sulfuric acid treatment.

Table 9 shows the average analysis that could be expected by lime pre-treatment and zeolite treatment, as well as the average analysis to be expected by treating this water with sulfuric acid.

A study of the conditions present in this particular case, reveals ample justification for the installation of the sulfuric acid method of treatment. Not only is it capable of producing satisfactory results, but such can be accomplished with a very low capital expenditure. The part played by the reactive colloids is of considerable importance to the success of this system. As a matter of fact, similar systems to this, have been installed and have been placed in successful operation in several plants using a water of this character.

At one plant, where a system of this type was first installed in one unit, results were so gratifying after months of operation, the plant superintendent requested an extension to include all units in the entire plant.

The question of handling sulfuric acid is one that is quite common to the petroleum industry in general. True, it is a material that requires careful handling and should not be thrown about promiscuously. With ordinary caution, it is used in hundreds of industries daily and fatalities resulting from the handling of sulfuric acid are considerably less, than fatalities from other materials considered far less hazardous. A few check analyses should be run daily on this system and it should be in charge of someone trained in the handling of chemical reactions. This, however, is not true of acid treatment alone, but is of equal importance, where lime is used as a pre-treatment. Zeolite softeners, however, offer some advantage in this respect as they are more or less purely mechanical, requiring only regeneration at set periods.

In closing, I wish to repeat the assertion made formerly, namely that any method of treatment of cooling waters or boiler feed waters, depend upon a thorough and competent study of the question in hand and should be taken into consideration only after studying carefully an analysis of the water, a survey of the plant conditions, — resulting in a final adoption of that process best suited to the individual requirements.

The author wishes to acknowledge the assistance of Mr. R. T. Sheen and Mr. J. J. Maguire of the staff of W. H. & L. D. Betz, in assembling the data in the preparation of this paper.

Waste Disposal

Second edition of Section 11 of the booklet "Disposal of Refinery Wastes" has been published by the American Petroleum Institute's Division of Refining. The section promotes the adoption of approved principles and practices for disposing of poisonous, irritant and malodorous gaseous wastes and refinery aerosols. Copies are available at 50 cents each.

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Patent Literature OF TODAY

Solvent refining. No. 2 107 429, *issued Feb.* 8, 1938; *filed Nov.* 24, 1934; *B. W. Story and V. A. Kalichevsky, assignors to Socony-Vacuum Oil Co.; 3 charts; 6 claims.*

A reagent consisting of aniline to which has been added 1% to 15% of benzol is mixed with an oil stock containing ingredients of low viscosity index. A substantial portion of the low viscosity-index ingredients are separated from the oil as an extract. The benzol addition produces "new and unexpected increases in the selectivity of the reagent".

* * *

Emulsion breaking. No. 2 107 473, *issued Feb.* 8, 1938; *filed Sept.* 12, 1934; *W. E. Elliott; no drawing; 2 claims.*

Combustible hydrocarbons are treated with an aromatic crystalline hydrocarbon compound (naphthalene) having mixed therewith a small quantity of nitro-benzol, sodium carbonate, carbon tetrachloride and iron sulfate. The mixture can be incorporated into fuel oil to break up emulsions and certain heavy compounds or used to treat fuel oil or crude oil to free hydrocarbons for cracking and distillation.

* * *

Hydrated olefines. No. 2 107 515, *issued Feb.* 8, 1938; *filed Aug.* 28, 1933; *F. A. Bent, assignor to Shell Development Co.; no drawing; 16 claims.*

An olefine is directly hydrated under superatmospheric pressure and temperature not above 374° C (705° F.) in the presence of water and a salt of the class consisting of sulfates of beryllium, magnesium and zinc.

* * *

Chlorine treatment. No. 2 107 713, *issued Feb.* 8, 1938; *filed Dec.* 10, 1928; *H. R. Rowland and E. J. Smith, assignors to Corona Conversion Corp.; 2 drawings; 14 claims.*

Oil is treated with gaseous chlorine in such manner as to eliminate gum-forming unsaturates and sulfur without drastic action upon the oil as a whole. An important feature is in allowing a relatively long period of digestion or reaction to elapse after introduction of chlorine (12 to 24 hours). A light acid treatment is preferably before the chlorine digestion.

* * *

Dewaxing. No. 2 107 770-1-2, *issued Feb.* 8, 1938; *filed Sept.* 22, 1934 *and April* 17, 1937; *M. L. Wade, assignor to Union Oil Co.; no drawings; 7, 4, and 8 claims respectively.*

To accelerate the rate of electrodeposition of wax a compound having a benzene ring nucleus, such as p-dichlordiphenyl, naphthalene, and alpha bromo-naphthalene, is added to the wax-bearing oil. Cresol, phenol, sodium phenoxide, and p-aminophenol are also used.

Use of fatty acids consisting of montanic, carnaubic, melissic, cerotic and stearic acids is covered in the second patent. The third covers additions of an extraneous high molecular weight natural ester type wax.

* * *

Alcohols. No. 2 107 794, *issued Feb.* 8, 1938; *filed Sept.* 1, 1933; *V. Ipatieff and V. Komarewsky, assignors to Universal Oil Products Co.; no drawing; 3 claims.*

In the production of alcohol from olefin hydrocarbons, olefins are treated with a phosphoric acid solution to which 5-10% nickel oxide has been added.

* * *

Cracking. No. 2 108 395, *issued Feb.* 15, 1938; *filed Dec.* 30, 1933; *F. W. Sullivan, Jr., assignor to Standard Oil Co. (Ind.); 2 drawings; 6 claims.*

By use of higher temperatures and pressures than normally used in commercial cracking processes and by use of selected charging stock, all recycling is eliminated while still retaining a high yield of gasoline. The process is operated economically on a commercial scale by separating the unconverted or insufficiently cracked material from the once-through reaction products and cracking the majority of it to olefinic gases. These gases are then recycled to the initial cracking step where polymerization and condensation to gasoline occurs.

As a charging stock a gas oil of 35° A.P.I. gravity is preferable. The fresh charge is initially subjected to 950-1200° F. and 750-3000 pounds per square inch pressure. Cracked products go to an evaporator maintained at relatively low pressure where tar and asphaltic materials are eliminated. Overhead products are passed to a bubble tower from which gasoline is eliminated as an overhead product. Heavy gas oil is eliminated from the bottom but is not cycled in the conventional manner to the cracking step. Light gas oil may be likewise eliminated from an intermediate point and a part of this may be recycled to the cracking step while another part may be used as quenching oil.

The degraded gas oil, having a density of 25-30° A.P.I. is then passed to a high temperature low pressure cracking step where it is cracked completely to gases and heavy tarry material. Following suitable separation steps, the olefinic gas from this step is recycled to the inlet of the initial high pressure cracking step.

* * *

Cracking. No. 2 106 013, *issued Jan.* 18, 1938; *filed March* 8, 1937; *E. A. Ocon; one drawing; 13 claims.*

Oil charging stock is vaporized with the aid of hot products from a saturating hydrogenation of oils deficient in hydrogen by directly contacting them with these products. Vapors so formed are cracking stock distillates and the residual liquid is a valuable product. Cracked products are treated with a polymerizing agent (metal halide type catalyst) to remove polymerizable constituents and then blended with light gasoline of the overhead products of fractionation.

* * *

Halogenated compounds. No. 2 106 353, *issued Jan.* 25, 1938; *filed July* 21, 1932; *S. L. Langedijk, assignor to Shell Development Co.; no drawing; 7 claims.*

Halohydrins are prepared by reacting an unsaturated open chain organic compound containing a tertiary carbon atom possessing a double bond in an olefinic linkage with a hypohalite ester containing an alkyl group contiguous to the hypohalogenous acid radical, in the presence of water.

Advantages lie in the fact that it is possible to prepare with comparatively small quantities of water, a concentrated halohydrine solution which does not contain any free hydrogen halide, cannot be decomposed, as is the case with a concentrated HOCl or HOBr solution, and in which alcohol is present only as the by-product and does not hinder the reaction.

* * *

Lubricating oil. No. 2 106 232, *issued Jan.* 25, 1938; *filed Oct.* 3, 1933; *H. Zorn and W. Rosinsky, assignors to I. G. Farbenindustrie Aktiengesellschaft; one drawing;* 5 *claims.*

A high molecular weight polymerization product prepared from isobutylene alone is incorporated in lubricating oil. The product flattens the temperature-viscosity curve. The mixture is then subjected to condensation in the presence of a Friedel-Crafts condensing agent (1% to 3%) such as the anhydrous chlorides of aluminum, zinc, tin and iron.

* * *

Alcohols. No. 2 106 877, *issued Feb.* 1, 1938; *filed Aug.* 22, 1930; *W. H. Shiffler, M. M. Holm, and M. F. Miller, assignors to Standard Oil Co.; no drawing; 9 claims.*

Tertiary amyl alcohol is manufactured by distilling a mixture of sulfuric acid and alkyl sulfuric acids derived from the absorption of amylene, and corresponding to tertiary amyl alcohol. The admixture contains an appreciable amount of free sulfuric acid and is substantially devoid of free alcohol. Distillation is carried out under a pressure

lower than atmospheric to hydrolyze and vaporize alcohol therefrom until the acid is reconcentrated.

The method avoids losses by polymerization and decomposition by distilling the alcohols under the reduced pressure and the quantity of alcohols approaches the theoretical yields.

* * *

Neutralization. No. 2 106 976, *issued Feb.* 1, 1938; *filed Dec.* 17, 1935; *J. M. Harris, Jr., and N. F. Black, assignors to Standard Oil Development Co.; no drawing;* 4 *claims.*

Sulfuric acid treated lubricating oil is neutralized by blowing the oil with ammonia gas at above the temperature of sublimation of ammonium sulfate. Ammonium sulfate is carried off in the evolved gases and deposited when the gases are cooled.

* * *

Alcohol recovery. No. 2 107 065, *issued Feb.* 1, 1938; *filed June* 20, 1936; *A. J. van Peski, assignor to Shell Development Co.; no drawing;* 16 *claims.*

Alcohol content of the polymer mixture formed during production of organic oxy-compounds by the treatment of olefines with water in the presence of a mineral acid-acting compound, is recovered by reacting the alcoholic content of the separated polymer phase with a metal hydroxide and carbon bisulfide to form a metal zanthate. Metal xanthate is recovered from the polymer phase.

* * *

Dewaxing. No. 2 107 137, *issued Feb.* 1, 1938; *filed Nov.* 1, 1933; *C. E. Adams and F. W. Sullivan, Jr., assignors to Standard Oil Co. (Ind.); no drawing;* 13 *claims.*

Wax-bearing lubricating oil is dewaxed by diluting with a wax antisolvent and a cracked naphtha. The diluted oil is chilled to precipitate the wax while the oil is retained in solution in the diluent. Wax is then separated and the diluent is removed from the dewaxed oil. Anti solvents include acetone, methyl ethyl ketone, and sulfur dioxide. Miscibility agents include iso-propyl ether and ethylene dichloride as well as cracked naphtha. A diluent mixture of cracked naphtha, acetone and iso-propyl ether is covered in one claim.

* * *

Cracking. No. 2 107 235, *issued Feb.* 1, 1938; *filed Aug.* 26, 1933; *M. W. Colony, assignor to Petroleum Conversion Corp.; one drawing;* 8 *claims.*

In converting oil to motor fuel in the vapor phase an inert gas is added to increase the mass of the mixture substantially. The mixture is then heated to 900° F. while passing rapidly enough through a heating zone that no substantial cracking takes place and no carbon is deposited. Conversion takes place in a "heat conserving zone" wherein time is allowed for the sensible heat to be imparted to the mixture without any addition of heat.

The inert gas serves to make the reaction less subject to temperature changes resulting from the heat absorption. About one-half pound of gas per pound of oil vapor is used. Preferably the gas is formed in the system itself and has the advantage of a high specific heat due to its substantial hydrogen content.

* * *

Wilshire Builds 4000-Bbl. Reforming Unit

LOS ANGELES, April 1.—Construction of a 4000-barrel per day Dubbs reforming unit is begun by Wilshire Oil Co. Also a new heater is being added to the 18,000 barrel topping-cracking unit at the refinery, which also operates a UOP catalytic polymerization unit in connection.

Topping 18,000 barrels of crude per day the plant makes about 2000 barrels of 250-E.P. gasoline, 4000 barrels of heavy 450-470 E.P. naphtha, and 12,000 barrels of topped crude which is charged to the cracking unit. The reforming unit will increase the gas chargeable to the polymerization unit, which is capacitied for 2,500,000 cubic feet per day.

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INDEX TO ADVERTISERS

Refining Technology Section

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Alco Products Div. of American Locomotive Co....R-159
Badger & Sons Co., E. B.....
Chicago Bridge & Iron Co.....
Crane Co. R-151
Clark Bros. Co. .....
Dresser Engineering Co. .....
duPont de Nemours & Co., E. I. R-169
Edeleanu Co., Ltd. .....
Gasoline Products Co. .....
Gray Processes Corp. R-165
Hanlon-Buchanan, Inc. .....
Johnston & Jennings Co. R-175
Kellogg Co., M. W. R-146
Koppers Co. .....
Lummus Co. .....
Monsanto Chemical Co. R-149
Nichols Copper Co. R-173
Petroleum Rectifying Co. of Calif.....
Polymerization Process Corp. R-153
Shand & Jurs Co. R-155
Sharples Specialty Co. R-171
Sun Shipbuilding & Dry Dock Co. R-161
Texaco Development Corp. .....
Universal Oil Products Co. .....

(*See also page 64*)

Activities OF EQUIPMENT MANUFACTURERS

A MILLION DOLLARS FOR RESEARCH—Expenditure for research in 1937 by Monsanto Chemical Co. was $1,011,629, it was announced in the company's thirty-sixth annual report. Of this amount, 28% went to improvement of present processes, 19% to new processes for present products, 41% to new products, and 12% to new applications. Laboratory work accounted for 68% of the total and cost of pilot plants and their operation for 32%.

"Improvement in processes helps us to stand the stress of more costly labor and higher taxes," said President Edgar Monsanto Queeny in his report. Research is analagous to structural cement in the protecting wall of chemical production, he said. Research has led from one product to another and to the utilization of by-products. Seemingly unimportant products have served to fill in the chinks and make the larger stones secure in this wall. Consumers have gained by a greater variety of better products at lower prices even though support of government steadily required a larger and larger share of the benefits of technological progress.

* * *

GAS INDICATOR—A new combustible gas indicator for measuring directly the combustibility and explodibility of gas-air mixtures has been developed by the Davis Emergency Equipment Co., 55 Van Dam St., New York. Weight of the indicator, complete with batteries, is only six pounds. Current is supplied by two standard dry batteries.

Resistance of the platinum filaments used in both the active and comparison cells is controlled within close limits to insure the same accuracy found in larger instruments. Filaments are interchangeable. The indicator is used in tanks for flammable liquids and gases, ship holds, and other places where flammable gas-air mixtures may be found.

* * *

STEAM JET EJECTORS—New bulletin No. 9046, covering single, two, and three-stage steam jet ejectors, is announced by Ingersoll-Rand Co., 11 Broadway, New York. These ejectors are for removing air, gas or vapors from condensers and vacuum chambers and are said to be able to handle any quantity of wet or dry mixtures at any vacuum with a high sustained efficiency.

* * *

MANOMETERS—The Meriam Co., 1955 W. 112 St., Cleveland, has issued a revised and enlarged edition of "The Manometer and Its Uses", a 50-page pocket booklet on pressure measurement. Beginning with elementary principles, it continues with an illustrated discussion of various types of manometers and their industrial applications. Conversion tables are included for various indicating fluids and instructions for installation.

* * *

FURNACES—"The Evolution of Furnaces" is the title of one of the spreads in a new 64-page catalog of the M. H. Detrick Co., 140 S. Dearborn St., Chicago, which deals with furnace design as applied to all types of furnaces. The new book deals with the latest methods of construction. Developments in cracking stills of various types are dealt with, showing how temperatures are controlled and heat losses reduced in refinery processes. The catalog is said to present a new technique in presentation, emphasizing its points in pictures and sketches rather than depending on text matter.

* * *

ADVERTISING PRIZE—An Annual Advertising Award has been won by Ketchum, MacLeod & Grove, Inc., and its client, the Koppers Co. The award was one of three in the classification "for a campaign appearing in trade and professional publications which is distinguished for technical excellence and ethical soundness." A part of this campaign was awarded a certificate of merit by the American Institute of Graphic Arts and three inserts were hung in the exhibition at the Lakeside Press Galleries in Chicago. Later they will go on a tour of the country.

The Annual Advertising Awards were originally instituted by Edward Bok and were known then as the Harvard Awards. They are now under the sponsorship of Advertising and Selling Magazine.

* * *

SALES ORGANIZATION REVAMPED—Q. M. Crater has been named manager of the petroleum and chemical section of the new Industrial department recently announced by Westinghouse Electric & Mfg. Co., East Pittsburgh. Announcement was made by C. B. Stainback, department manager. Mr. Crater was formerly in the sales department, Steam Division. In the newly created Industry Engineering department, Manager C. A. Powel announced that Phelan McShane is manager of the mining, chemical and petroleum section.

* * *

WIRE ROPE—Miniature models of high speed rope making machines which will make 3/32-inch wire rope for spectators will feature Bethlehem Steel Co.'s. exhibit at the Oil World Show in Tulsa, May 14.

* * *

PRESSURE VESSELS—Some theories on the design of covers and flanges for pressure vessels and piping, with mathematical proofs and records of tests, have been published as Bull. 219 by the A. O. Smith Corp., Milwaukee. The bulletin is a reprint of several articles published in Heating, Piping and Air Conditioning magazine and of material originally presented at the annual meeting of the American Society of Mechanical Engineers in Dec., 1934, by members of the research staff.

* * *

POTENTIOMETER CONTROLLER—A new air-actuated control, developed by Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, as an accessory to the Micromax potentiometer, is announced in Catalog N-00B, now available from the company. The new instrument moves the control valve not only as a function of temperature change, it is pointed out, but as a function of both how long and how far temperature is off the control point. Manual control is provided and throttling range is adjustable. The instrument has been tested in actual refinery operation, it is said.

* * *

ENGINE FOR WELL PUMPING—A new Fairbanks-Morse two-cycle, vertical, convertible gas and oil engine, Model 34-AC-6, has been developed particularly for oil-well pumping. Low overall height satisfies requirements for accessibility and limited head room on high foundation structures. It is a medium-weight, heavy-duty engine built for continuous service. Speed ranging from 300 to 850 rpm. is governor controlled. Details are given in Bulletin 3400, available at company offices, 600 S. Michigan Av., Chicago.

* * *

CRYSTAL DEHYDRATION—Automatic dehydration of crystals is now offered by The Sharples Specialty Co. in its new Super-D-Hydrator suitable for drying ammonium sulfate and many other crystalline materials. Capacity is two tons hourly when set to operate on a 45-second cycle. No operating labor is required.

* * *

HEAT EXCHANGERS—The Griscom-Russell Co., 285 Madison Av., New York, has issued a new 16-page bulletin (No. 915) on Vaneflo shell-and-tube heat exchangers.

* * *

EXPANSION JOINTS—E. B. Badger & Sons Co., Boston, has issued Bulletin 100 describing packless corrugated type expansion joints. The bulletin covers the history of this type of joint, improvements, and tells how to select them.

Women Shun Dirty Stations

A Doctor's Wife Discusses Unclean Toilets in Connection with the Campaign Against Venereal Disease

By Elizabeth Platt Maison

AN INNATE FEAR of dirty public toilets does exist and is very real in the minds of women today. Ever since germs were found to thrive in dirt and filth, the idea of disease has been associated with uncleanliness in the minds of all of us.

Schools have courses in hygiene which advocate personal cleanliness and cleanliness of surroundings as foes of disease. Women's magazines emphasize cleanliness in articles which tell women how to keep themselves, their houses, their food and their children clean and healthy. Manufacturers of cleansers and disinfectants appeal to women in advertisements to keep clean and avoid disease. Cleanliness is one of the chief objectives of every housewife and mother.

The venereal disease campaign of the government is reinforcing these ideas of cleanliness and again calling women's attention to dirt as a breeder of disease. Among other things in this campaign the government is putting up posters in public toilet rooms to remind people of the danger and menace of venereal disease. The effect of such a poster is profound.

A poster in a public toilet room will make almost any woman afraid she will contract syphilis from an unclean toilet seat, and make her distrustful of a public toilet which doesn't have the proper care to keep it clean. Even I, who as a doctor's wife know that the incidence of venereal disease from toilet seats is rare, start a little when I see such a poster and feel uneasy about a dirty toilet.

So the woman who drives up to a service station to use a rest room has been educated by many forces which have prompted in her a distrust, a fear and a dislike for uncleanliness. She may not actually fear she will contract a venereal disease from a toilet seat, but she will shy away from it as from something unhealthy. The dirty rest room is fighting against a woman's distrust of dirt, against her own standard of cleanliness and against her aesthetic sense. Recently a woman here in St. Louis said to me; "It makes me furious to have to use some dirty service station toilet room when I'm used to a clean bathroom at home and at hotels."

Disgust is a woman's reaction to a dirty toilet room and her actions prove it. When she finds a rest room at a service station which has a dirty floor, littered with paper, a dirty washstand, toilet seat and bowl and a bad odor, her first impulse is not to use it. If she does use it, I notice that only too frequently she will take no care of it and will pay little attention to the condition in which she leaves it.

Above everything she will mark that station as the wrong place to stop. Such a rest room encourages women in the practices which have branded them as, "dirtier than men", as station operators know. After all the woman in this dirty rest room is interested in protecting herself from dirt and disease more than in protecting the cleanliness of a rest room.

On the other hand, a clean toilet room will encourage women to keep it clean. The cleanest toilet rooms I've ever seen I found in private clubs and some night clubs in Chicago and Cleveland. Here the rooms were kept spotless by maids in constant attendance who cleaned up each toilet after it had been used. I have been repeatedly surprised at how little cleaning these maids had to do to keep an already spotless rest room clean. These were not pay toilets either but the maid collected tips from the grateful customers who were glad to pay to use a really decent toilet.

What influences a woman to choose one station or another when she is traveling by automobile?

When a car slows up by a service station and a woman hangs her head out of the car window she isn't looking at the color or brand of gasoline being sold; she is looking for a sign reading, "Clean Ladies' Rest Rooms". I know I'd much rather take a chance on a station with such a sign than on a station with no sign. If there is no sign the station may only have one rest room for both men and women and it is usually dirty.

Why not advertise a good rest room when that's what the woman is looking for? If she sees such a sign she will then look at the appearance of the outside of your station. Does it look clean and neat, does it look well kept up? If it does then the woman will stop and try it. If she finds the rest room dirty she may use it anyway but will say to herself, "I'll never come back here again", and say nothing about it to the attendant.

IF she travels that particular route often she will remember the dirty rest room and avoid the station on her next trips. In several trips between Chicago and Cleveland my husband and I have picked out certain clean and neat service stations where we have found good rest rooms and have arranged to stop at these particular stations every time we made the trip.

From my own experience and from the experiences told me by other women I have gathered these ideas of what a woman hopes to find in a service station rest room.

1. Clean toilet seats and bowls, clean floors and washstands.
2. Some kind of clean towels and soap.
3. A closed receptacle for disposal of waste.
4. Sanitary seat covers which are added protection and are greatly appreciated and all women, I am sure, are only too glad to pay the extra penny for them.

Larger Jobber Profits
WITH A BUDGET YARDSTICK

Increase in Net Profits in 1938 of 26% Is Goal of Six Midwestern Marketing Companies That Tailor Expenses To Fit Anticipated Gross Profits

By Allen S. James
N. P. N. Staff Writer

TULSA

SIX JOBBING companies in five middle western states who have adopted the policy of following carefully developed operating guides based on anticipated gallonage, have written down 1937 as the most profitable of the six years in which they have followed this practice.

These six companies, affiliates of one of the larger Mid-Continent refining companies, but operated strictly on a distributor basis, have been following starting with 1932 the detailed operating guides developed by the refiner partner. Each company's guide has as its standard the estimated gross profit for the coming year, to which its expense items have been so shaped that the company will operate at a profit.

These operating guides were developed by the refining company back in the depression days for two reasons. The company wanted to protect whatever investment it had in the distributing company and it wanted to keep that business operating as an independent unit. Taking over the business was the last thing the refining company wanted to do.

By following the standards which have been set up year by year, the jobbing companies have been able to operate at a profit, though small at times, even in the face of the narrowing margins the past few years.

Any jobbers who could not mark 1937 down as a good profitable year, might find it advantageous to study these operating guides with a view to adapting them to their own operations for 1938.

The six jobbing companies which have been following the guides are looking forward to this year as one that will equal if not exceed last year—and what they can do with the guides any other alert jobber can do just as well.

The 1937 operating guides for the six jobbers anticipated an average gross profit on all petroleum products sold of 2.69 cents per gallon. No accessories sales profits were included in this item. The gross profit figure was arrived at only after an exhaustive study of each jobber's set-up. From this study, by products and classes of business, it was determined what might be reasonably expected in the way of gross profit from the company's operations.

An earlier article in National Petroleum News, March 17, 1937, gives additional detail as to the manner in which the operating guides for these six companies were set up.

The gross profit item having been determined for the six companies, the items of expense were studied. Certain of these expense items—depreciation, rent, taxes and insurance—were well pegged. The tailoring to fit anticipated gross profits accordingly was done on the list of variable expense items. These included commissions, salaries, auto and truck expense, light, heat, power, water, advertising, repairs and maintenance, travel and entertainment, shortages, and miscellaneous items which included supplies and donations.

In the study of cost items of the six jobbers made in this article it should be noted that a depreciation allowance is not included, this item varying widely with the individual company.

The consolidated expense record of the six companies for the past six years is shown in the following table. Beside each expense total also is shown the average profit, before depreciation, in cents per gallon.

Year	Expense	Profit
	Cents per Gallon	
1932	2.83	0.02
1933	2.81	.01
1934	2.47	.05
1935	2.25	.13
1936	2.22	.39
1937	2.12	.66

It will be observed from the table that the six jobbing companies have whittled 0.71 cent per gallon of products sold off their total expense while increasing net profit 0.64 cent per gallon since they have been using the operating guides.

A more detailed picture of the performance of these six marketing companies since 1932 is shown in table 1. It will be observed first that their gross profit declined through 1933 and 1934 to reach a low of 2.38 cents in 1935,

TABLE 1

Performance of Six Jobbing Companies for Past Six Years and Budget Prepared Them for 1938 as Part of Their Operating Guide

	1932	1933	1934	1935	1936	1937	Budget 1938
(Figures in cents per gallon of all petroleum products sold)							
A Gross profit from sales	2.85	2.82	2.52	2.38	2.61	2.78	2.69
Direct station exp.	2.20	2.23	1.92	1.72	1.65	1.55	1.38
Administrative exp.	.63	.58	.55	.53	.57	.57	.48
B Total expense	2.83	2.81	2.47	2.25	2.22	2.12	1.86
Profit—(A minus B)	.02	.01	.05	.13	.39	.66	.83

During the past two years, the matter of taking care of the rapidly increasing demand for burning oils and Diesel fuel, without accumulating excess supplies of gasoline during the winter, has become extremely important Failure to find a proper solution of this problem . . . . . has been accountable for the present heavy gasoline stocks . . . . . OIL AND GAS JOURNAL, *January 13, 1938*

DUBBSCRACKING is the proper solution of the problem because you can run Dubbscracking units to suit the seasons—and the market

In summer you crack gas oil and fuel oil and all kinds of oil to make the biggest possible yield of Dubbscracked gasoline

In winter you sell your straight-run gas oil for domestic burners and Diesel engines and crack heavy fuel to make the gasoline you need

Or you crack gas oil and fuel oil to make the utmost possible burner oil and the least gasoline—the best of burner oil and the best of gasoline

Summer or winter, Dubbscracked gasoline goes to market when other gasoline goes to storage

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

TABLE 2

Breakdown of Consolidated Expense* of Six Jobbing Companies for 1936 and 1937 and Comparison of 1937 Performance with Budget for that Year

Class of Expense	1936	1937	Budget 1937
	Cts. Per Gallon Of All Products Sold		
Salaries and commissions	0.79	0.62	0.66
Auto and traveling	.14	.14	.13
Telephone and telegraph	.01	.00	.01
Light, heat, power and water	.03	.02	.02
Rentals	.22	.28	.26
Advertising	.10	.10	.10
Insurance	.04	.04	.04
Taxes (including licenses)	.12	.12	.11
Repairs and maintenance	.10	.13	.09
Miscellaneous	.01	.01	.02
Shortages	.09	.09	.06
Administrative	.57	.57	.51
Total	2.22	2.12	2.01

*Depreciation allowance not included.

but began building up again in 1936 and in 1937 was only 0.07 cent under the gross profit shown in 1932.

The jobber companies have cut away at the direct station expense until the 1937 item was 0.65 cent per gallon of products sold to the 1932 item. Much of this cut probably can be attributed to a close study of outlets and the weeding out of those which showed little promise of becoming profitable operations.

The administrative expense item was lowered steadily from 0.63 cent in 1932 to 0.53 cent in 1935 but moved back up to 0.57 cent per gallon of products sold in 1936 and held that point in 1937.

It is interesting to note also that the operating budget for 1938 anticipates a gross profit of 2.69 cents a gallon. This is slightly above the anticipated gross profit for 1937 but 0.09 cent a gallon under the actual gross profit for that year. A further reduction in direct station operations is anticipated, along with one in administrative expense, which naturally will lead to a lower anticipated total expense and a resultant increase in profit, before depreciation, of 0.83 cent per gallon of products sold. This is 0.17 cent higher than actual profit in 1937.

A breakdown of the total expense item of 2.12 cents for 1937 is shown in table 2, along with a breakdown for 1936 and the 1937 budget.

While the budget anticipated for 1937 a total expense of 2.01 cents, actually the total was 2.12 cents. Higher administrative expense than had been anticipated, together with slightly higher rentals, taxes, repairs and maintenance and shortages, more than offset the lower salaries and commissions paid per gallon of products sold and the slight reduction in miscellaneous expense.

Just how one of the six companies adjusted its 1937 operations to the budget which had been prepared as a part of its operating guide is shown in table 3.

This distributing company had one bulk plant and 12 service stations, and sold 2,590,000 gallons of petroleum products. Any jobber can, according to the refining company's official in charge of preparation and adaptation of the operating guides, prepare his own guide provided he has two prerequisites.

"The jobber first must have," this official said, "an accounting method which will permit him to know within 10 days after the close of each month, just what his business did, just what each operation returned in the way of gross profit and how much it cost him for each operation. With that knowledge he should be able to adjust his operations from month to month so that his total expense will not top his gross profit for any extended period.

"And then he must have the initiative to analyze his business sufficiently to prepare an unbiased operating guide."

The preparation of these guides for the six jobbers' business operations involved a detailed examination of the business individually, the first step being a study of the organization's personnel and properties along the following lines:

(1) Detailed appraisal of physical property.

(2) Examination of records which include the following: Deeds, leases, equipment receipts, equipment record, agency contracts, quantity discount agreements, sales contracts, salary and commission contracts, and price schedules.

(3) Study of organization classified as follows:

Salesmen—Number of salesmen, apparent ability, compensation, equipment, methods of reporting and territory covered.

Service Stations — Sales ratios, appearance, equipment, method of operation, standard of service, location, plan of solicitation and follow-up, personnel, and cost of operation.

Bulk Stations—Sales ratios, appearance, equipment, motor equipment, method of operation, location, sales plan, personnel, and cost of operation.

(4) Study of Policies and Methods, grouped as follows:

Sales—Sales representation through reseller and dealer accounts; sales to consumer trade; agreements and contracts employed; discount policy, and potential market development for full merchandise line.

Advertising—Status of advertising in force; plan followed, and expenditure.

Credit—Control of credits and collections; condition of receivables, and collection methods used.

(5) General, which included:

Analysis of expense,—direct station, and administrative, by units. Sales promotional activities. Local standing and connections.

Then came the detailed analysis of the gross profit possibilities by a study of (1) gallonage by products, and (2) gallonage according to its distribution, the latter classification being made because it was realized that some classes of business brought more profit than others.

From these studies the reports were prepared which formed the basis for the guides for each of the six jobbing companies.

TABLE 3

Comparison of Actual Expenses* of One of the Six Companies, with its Budget for 1937. This Company Had One Bulk Plant and 12 Service Stations and Sold 2,590,000 Gallons of Products

Class of Expense	Performance 1937	Budget 1937
	Cts. per Gallon of All Products Sold	
Salaries, commissions	0.28	0.27
Auto and traveling	.05	.05
Telephone and telegraph	.00	.01
Light, heat, power, water	.01	.02
Rentals	.50	.43
Advertising	.11	.11
Insurance	.05	.04
Taxes (including licenses)	.11	.12
Repairs and maintenance	.10	.06
Miscellaneous	.00	.01
Shortages	.14	.06
Administrative	.42	.36
Total	1.77	1.54
Actual net profit	.64	.30

*Depreciation allowance not included.

N.P.N. says this is an advertisement but we say it's national petroleum news

20,000 gallons a month is not an unusual record for this Verbrugge Oil Company station at Bridge and Indiana Streets in Grand Rapids, Michigan

Careful Selection of Brand Brings 400% Increase In Three Years

Here is a direct answer to the midwestern jobber whose letter requesting advice as to the selection of source of supply appeared in the February 2 edition of N.P.N.

MONTH AFTER MONTH, year after year, this page has recorded letters from happy and enthusiastic jobbers who have shown phenomenal gallonage increases after deciding to hang out the Phillips 66 Shield. Letters proving without doubt that Phillips continuous and effective advertising program brings in new customers by the carloads to stations flying the Orange and Black shield, and that the high quality of Phillips 66 products keeps the new customers coming back for more.

Particularly timely, in view of debate which has recently been raging over the above mentioned letter in the pages of N.P.N., is a recent letter from Ed Verbrugge of Verbrugge Oil Company of Grand Rapids, Michigan.

Mr. Verbrugge says:

"In viewing my past few years of relationship with your company, I thought it would be timely to drop you a few lines relative to my business and the distribution of Phillips 66 products.

CAREFUL SELECTION OF BRAND PAYS!

"Since I organized my company, November, 1934, at which time I took your franchise after investigating a great many propositions, I have found my selection at that time wisely and beneficially made.

"The gallonage of my company when it was first organized was approximately 40,000 gallons per month. Since 1934 my gallonage with Phillips 66 products in this territory has increased a little over 400%.

IN SPITE OF BAD PRICE SITUATION

"This I consider a gratifying figure considering the fact that in our particular market, the price condition has not been very good, and it is to the quality and performance of Phillips 66 gasoline and Phillips 66 motor oil together with your sales helps and advertising that I give credit for this gain.

"With my success in the dealings I have had with your company, together with the high quality of Phillips 66 gasoline and Phillips 66 Motor Oil, I feel I am helping other jobbers who are contemplating a change to tell them of my success with your line."

ANSWER TO "MIDWESTERN JOBBER'S" QUERY

There, Mr. Perplexed Midwestern Jobber, is the answer to your question written by a man who faced exactly the same problem you are now facing and whose decision, we are sure you will agree, has been demonstrated to be 400% correct.

If the problem of source of supply is bothering you, if you are not satisfied with your present gallonage and profits, Phillips would like to hear from you. It may be that your territory is still open.

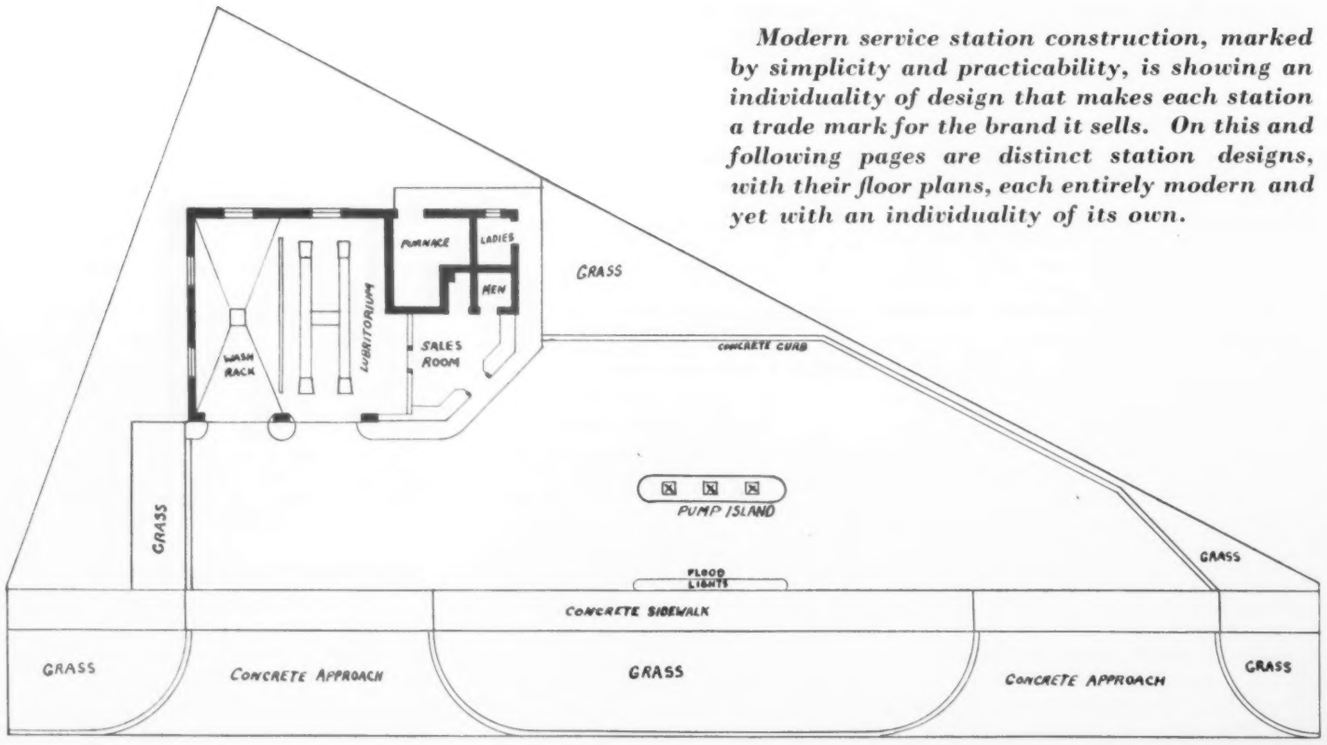
We will be glad to answer any questions you may have with regard to our franchise in your territory. Write, wire or phone

PHILLIPS PETROLEUM CO.
Bartlesville, Oklahoma

Chicago Minneapolis Peoria
Indianapolis Des Moines Omaha
St. Louis Kansas City Wichita
Tulsa Amarillo

Three Modern Service Stations

Modern service station construction, marked by simplicity and practicability, is showing an individuality of design that makes each station a trade mark for the brand it sells. On this and following pages are distinct station designs, with their floor plans, each entirely modern and yet with an individuality of its own.



White Glazed Brick Station

Located in South Bend, Ind., this Ohio Oil Co. station is typical of the stations which this company will build in 1938.

The exterior walls of the building are white glazed brick, backed up with common brick. The sign reflector, cornice and parapet are tempered presswood on wood frame the surface painted. The sash are of steel and the doors of wood.

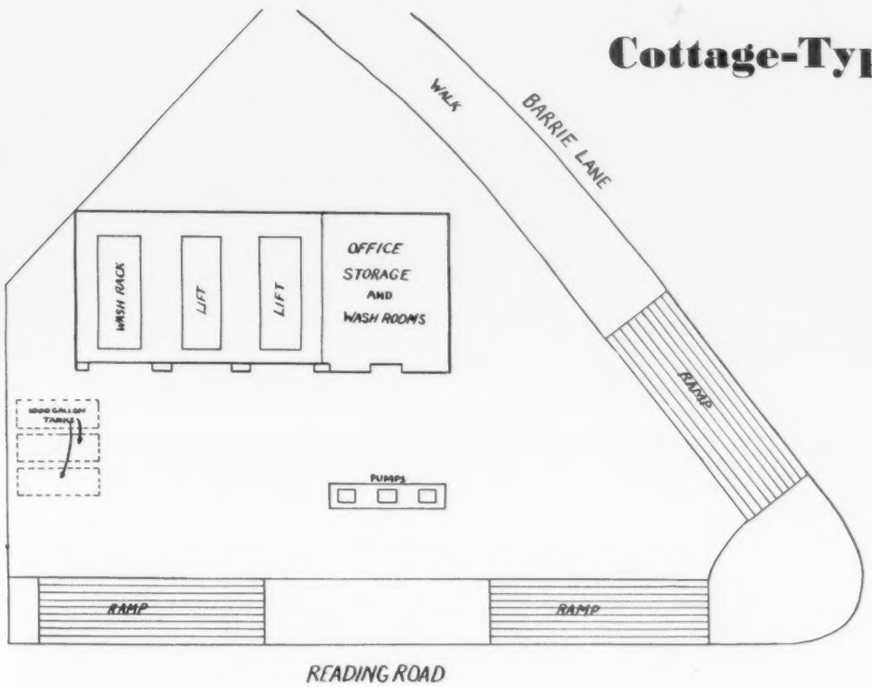
Interior partitions around the furnace room are hollow tile or brick, while the others are plaster on frame. Ceilings are also plaster. All interior surfaces are painted with synthetic enamel up to wainscoting height, and from that point on up with aluminum paint. All floors are of concrete.

The heating plant is a hot air, coal fired furnace with forced circulation. The strip sign around the exterior of the building is illuminated with light bulbs concealed at the outside edge of the overhanging cornice which also serve to illuminate the face of the building and also part of the drive. The approaches, drives, and pump island are illuminated in a majority of cases by floodlights.

Storage for canned oil is provided in the half partition shown on the floor plan between the lubritorium and wash bays. Tire storage is maintained in a recess above the ceiling of the sales room. This recess opens out into the lubritorium above the partition between the sales room and the lubritorium. This partition is of glass in steel sash identical with that used in the exterior walls.

The display counter shown on the floor plan immediately behind the windows of the sales room covers cupboards which are used for accessory storage. Supplies, equipment and merchandise of various types are stored in the closet and in the space above the coal bin in the furnace room.

Cottage-Type Station of Brick



The Pure Oil Co.'s familiar English cottage type design is here incorporated in a three-bay station at Reading Road and Barrie Lane, Cincinnati. It was designed by Pure's engineers and completed in the summer of 1937.

The building is of common brick and painted white both inside and out. The roof is blue tile, with copper gutters, flashing and down spouts. Two rest rooms are provided, and the building is heated with gas unit heaters and gas radiators.

The drive is of concrete, and two 35-foot curb cuts are provided. The building measures 60 by 34 feet overall. Two 1000-watt floodlights and two 300-watt island lights illuminate the station.

West Coast Station Mostly Canopy

This Union Oil Co. station, located in Westwood Village, Cal., is well adapted to property having a large frontage so arranged that it is possible to serve one street only.

To accomplish this purpose, a steel canopy 51 feet in length was constructed from the property line to the sales room, providing ease of access and egress to the pump islands so arranged as to permit the simultaneous serving of four cars. The lubrication room housing three hoists is constructed as a wing to the sales room, and due to climatic conditions it was unnecessary to enclose this lubritorium room, with the result that a general air of spaciousness is given the entire unit.

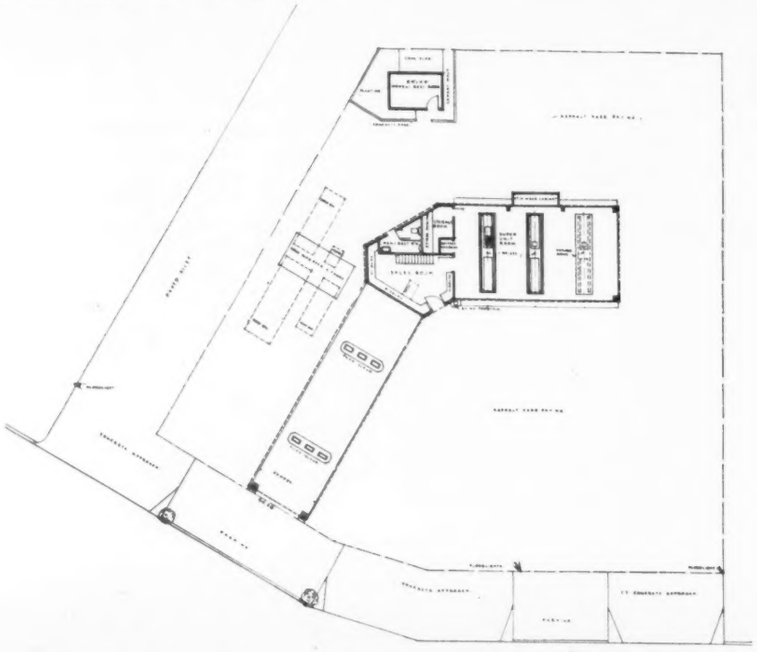
Supplementing the two service areas of pump islands and lubrication room are a large sales room and storage room for display and storage of merchandise as well as a men's rest room.

As an item of special convenience and attraction a detached steel building, with its interior decorated and treated in the modern trend, has been installed as a women's rest room.

Due to the peculiar topography of the country surrounding this station, it is located in a natural basin, and to take full advantage of this condition an artistic tower of steel construction was erected immediately above the sales room and at the terminus of both the pump island and the lubrication canopy.

This tower extends to a height of 65 feet above ground and is surmounted by a 10-foot revolving Neon sign. The upper portion of this sign and tower are visible for over a half mile in all directions.

The entire building is constructed of steel and sheet metal. Other features include concrete slabs under the pump island and hoist canopy, asphalt paved yard and the latest equipment, including computing meter pumps, hydraulic hoists, air and water wells, floodlights, and refrigerated drinking water.



DETROIT UNLOCKS Treasure Chest..

JOBBERS PROFIT!

Restrictions are off ... The bars are down ... Car makers have opened the treasure chest ... And jobbers now may share widely in the profits from the rich extreme pressure business.

Gone are the days when car manufacturers handled a considerable part of the business ... on their own branded products, through their own service departments. They've learned from experience that certain extreme pressure lubricants marketed by jobbers meet all requirements.

Leader in volume of sales among these lubricants is Penola Expee Compound ... For over four years sold and used extensively ... under its own label or as a private brand ... More than meets every specification ... Adaptable to transmission, steering gear assemblies, and conventional spiral bevel gear differentials.

The field is wider than ever. Only three makes of the 1938 cars don't require an extreme pressure lubricant. Dip into the treasure chest. Write Penola today!

PENOLA EXPEE COMPOUND

Sold under its own or private label

PENOLA INC. • 30 ROCKEFELLER PLAZA, NEW YORK CITY • FORMERLY PENNSYLVANIA LUBRICATING COMPANY

INCREASING IMPORTANCE Of the Independent Jobber

By Elmer Ledbetter*

Present Economic Trend Is in His Favor, Convention Speaker Brings Out; Cites Value to Oil Industry of Jobbers as Subordinate Owners in Marketing; Urges Less Strife and More Cooperation in the Industry to Compete with Other Industries For Share of Consumer's Dollar.

The accompanying paper was presented by Elmer Ledbetter of Detroit, president of the Wayne Oil Co., at the joint annual convention March 25 of the Michigan Petroleum Assn. and the Retail Gasoline Dealers Assn. of Michigan.

A MAN in the center of a tornado would probably be quite confused in attempting to arrive at any idea as to its trend. Yet in spite of the fact that within a tornado is about every kind of confusion and destruction, nevertheless if you get away some distance from it, you will find it moving across the country in a more or less consistent and predictable course.

For an oil man such as myself to remove himself to a sufficient degree of detachment as to enable him to discover general trends might not be easy. Indeed it might not be possible. Therefore, I take it you will understand that I feel that the subject assigned to me is not an easy one for me to handle.

Trends can be classified as good and bad trends. If we can figure out the trends we can boost along the good ones and try to put the brakes on the bad ones. Just refusing to recognize a trend doesn't embarrass the trend at all. It keeps right on with its trending and the first thing you know it has traveled its course. When a trend has run its course about the only thing left to do is to make the usual comparisons between the relative values of hindsight and foresight.

Trends can be further classified into minor and major trends. Among the trends in the oil business that I would put in the minor class, would be;

1—The tendency toward economic adjustment of dealer margins.

2—The tendency toward larger, more pretentious units in the retailing field.

3—The tendency to overbuild the reasonable number of gasoline stations.

Certain other present trends could be classified as major trends, such as;

1—The trend toward government control of the oil business.

2—The trend toward group organizations and the development of competition between groups.

3—The trend toward a position of greater importance for the jobber in the oil business.

We will not have the time to discuss those classified as minor trends. We will, however, touch on those labeled as major trends, the first of which has to do with the drift toward government control.

The example of a tornado cited above might not be such a poor one with which to illustrate this trend. Certainly there is enough turbulence in the oil business to satisfy the most trouble-thirsty people we have. However, it is not my purpose to dwell on our disputes among ourselves, the prosecutions, investigations, claims and counter claims, charges and counter charges, and all the noise and confusion that seems to be a part of our business, but to suggest that we pipe down a bit to avoid contributing too much to the trend that is becoming increasingly apparent. We mean the trend toward government control of the oil business.

For such a thing as government control or ownership ever to happen in the opinion of most oil men would be a calamity of the first degree. No business of such size, that has had its every root, branch and twig given to it by private enterprise can be brought under government control without dangerous dislocation of vested rights and interests. However, the fact that you don't like a thing is no reason why you don't have to reckon with it.

What is the meaning of the avalanche of fair trade laws all over the country?

Six Trends in Marketing

● Six economic trends that are affecting the status of the oil marketing business are outlined and some of them discussed in the accompanying article, as presented by Elmer Ledbetter, independent marketer of Detroit, before the recent convention of Michigan marketers and dealers there. The minor trends he classified as:

1—The tendency toward economic adjustment of dealer margins.

2—The tendency toward larger, more pretentious units in the retailing field.

3—The tendency to overbuild the reasonable number of gasoline stations.

The major trends he classified as:

1—The trend toward government control of the oil business.

2—The trend toward group organizations and the development of competition between groups.

3—The trend toward a position of greater importance for the jobber in the oil business.

* President of Wayne Oil Co., Detroit.

Just this, in my opinion. It means that the various factions in the oil business don't have the gumption to get together and adjust their differences in a sensible way.

How anyone in the oil business can look at this flood of fair trade bills and fail to see in it a trend toward government control is beyond me.

I want to compliment this jobber's association for its wisdom in having a place on its convention program for the retailer's association. You are pioneering a big important thing. More of this kind of thing is what the whole industry so sadly needs.

What are the political reasons for a trend toward government control. They are:

1—That oil is natural resource
2—It is a tremendous reservoir of votes
3—There is an increasing amount of noise in the oil business.

What is meant by that last—there is an increasing amount of noise in the oil business? Just this: There is an old saying that shoemaker's children go without shoes. That could be brought up-to-date by saying that the oil business is being run without oil. There is too much friction. Animosities between majors and jobbers, between suppliers and dealers, suspicions, jealousies, lawsuits, prosecutions, feuds, price wars, all combining to attract a lot of attention—the wrong kind of attention. It's likely to attract the attention of politicians who may get the idea that something should be done about it. Let's stop the noise before the policeman comes.

PERHAPS this is a delicate subject for an oil man to be talking about. Maybe it would be better to soft pedal such a subject. I'll take this chance. Operating under government ownership is not my conception of the way the American oil man wants to operate. Not only should we talk about it, but we should do something about it. One thing we can do to put the brakes on this trend is to quit attracting the attention of the world to our domestic troubles. In fact, the very best thing we could do would be to quit having domestic troubles. Is that too big an order for the oil business? I don't think so.

Major trend No. 2 is the trend to group organization and competition between groups.

Just a year ago at your 1937 convention I made a suggestion in these words: "Competition is taking on a new form. It is passing from a free-for-all between individuals to competition between groups. It looks to me like it is necessary to organize in self defense if for no other reason. Powerful organized groups are springing up all around. Possibly when everybody and every business has become organized we will be right back where we started. But until that time comes, the oil business can profit by organization and co-operation."

All of you are aware of course of the large movements toward trade organizations made in the past year. The whole country is becoming organization conscious. The small business man is organizing as never before in the history of this country.

In my opinion this trend is one of the most important having anything to do with this business, because of the fact that competition is thus changing its character and is developing toward competition between groups. The oil business is faced with the necessity of competing with other groups for its share of the consumer's dollar. This is a new experience and it can be a very serious one.

Let us take a look at what has happened to the building industry in recent years. There never has been a time when the country was so underbuilt or when everything pointed so definitely and logically toward a building boom. The building business, however, failed to organize and compete successfully for its share of the consumer's dollar. Mortgage moratoriums and what not combined to make an unattractive looking picture to the man that had the dollar, as compared with some other things.

The automobile business for instance got a lot of the money that the building business might have had. This was a trend that the people in the building business might have foreseen and avoided, had they been properly organized and alive to the situation.

This particular problem as it affects the oil business is much simpler than it was even for the building business. We are not faced so much with the necessity for building an attractive picture to the consumer. He uses just about as much gasoline whether he likes us or not. The total consumption of gasoline is a more constant factor than that pertaining to most other products. It is wholly conceivable that the total consumption of radios is susceptible to being increased or diminished considerably. The demand for Post Toasties is probably in direct proportion to the advertising of Post Toasties. However, it is questionable if all the advertising in the world will cause automobiles to use any more gasoline, and it is likewise true that it would take a lot of ill-will on the part of the public to cause an automobile to use any less gasoline.

What I am driving at is this, the public has voluntarily set aside a very definite specific share of the consumer's dollar for the purchase of our product. We are relieved from the necessity of promoting the consumption of our product, so what do we do? We proceed by fighting amongst ourselves by insane price wars to try to convince the public that what they are perfectly willing to spend for our product is too much. You can rest assured that if we succeed in doing this, other groups will be alert enough to grab up the money. The public is willing that the oil business and every one of its branches be reasonably profitable. It is to the public interest that this be so. If we lay ourselves open by lack of sensible organization and co-operation to the influence of competitive groups who are anxious to get part of our share of the consumer's dollar, we have nobody to blame but ourselves.

If we incapacitate ourselves by our own internal strife and friction from commanding our share of the consumer's dollar, certainly if we do not deserve government control we at least should be put in a sanitarium of the type that specializes in mental diseases.

If we fail to take a sympathetic interest in the problems of those in our own group with whom we are competing, what hope is there for our group to compete successfully for our part of the consumer's dollar. If we don't *try* to get together, we *won't* get together. If we *don't* get together we will probably be poor instead of prosperous.

Major trend No. 3 is that having to do with the increasing importance of the jobber. Aside from the purely economic need for the jobber in our business machinery there are other more-or-less transient reasons for the jobber's importance. One in particular would be the divorcement legislation pending in the Federal Congress. If this goes through, it would seem that good jobbers would be at a premium for some time to come.

ONE of the reasons for this jobber trend is the fact that the jobber can do the job for less money. That's the real economic reason for the jobber's existence and that is the reason why the jobber will always have his place in the oil business. In this age of mass production of manufactured goods and of tremendous merchandising institutions doing business directly with the public successfully and economically, much confusion has arisen in the minds of people. They are apt to get the idea that the principles which are highly economical and successful in one enterprise can be applied with equal success to all enterprises. This is far from the truth. "From factory direct to you" is no plan for the oil business. The oil business just isn't that kind of a business.

Let's analyze this jobber importance a little further. Let me ask this question: Is there any one factor in business success of greater importance than intense personal interest in the business on the part of those engaged in it? I think not.

Then let me ask this question—Who takes the greater interest in any business—the owner or the employe? You know the answer.

There is just one irresistible conclusion: Where the character of the business permits, the more owners you have scattered through the organization from top to bottom, the more solid the whole structure will be. The oil business is particularly susceptible to this type of organization. Don't have any doubts, therefore, of the importance and security of the

jobber in the oil business. There will be no jobbers left anywhere in any business when there are none in the oil business.

Let's look for a minute at what has happened in other businesses that have used this principle of subordinate owners similar to the jobber in our business. Where would you look to find a business that was least susceptible to that type of operation—one that held the least promise of results by establishing subordinate owners. One such business, I would say would be the banking business. There is one business where a military type of organization would seem to be most suited, and that is the kind of organization most frequently met in that business. A good many years ago, however, one old far-sighted pioneer used the subordinate owner principle in such an unpromising field as the banking business and thereby built one of the most famous and powerful banking houses in the whole world, the House of Morgan.

There's another example of a man who did the same thing in a less promising field than the oil business. Andrew Carnegie did it in the steel business and, by having in his organization a bunch of subordinate owners, all becoming millionaires, he made such progress that the rest of the gang couldn't see him for his dust.

The smart refiners today are those who will take a leaf from the old book of procedure used by J. P. Morgan and Andrew Carnegie and see the golden value of the subordinate owner—in our case the oil jobber.

Gear "Lube" Classifications Simplified by S. A. E.

NEW YORK, April 2.—Another encouraging step toward simplification of gear lubricant classifications has just been taken by the Society of Automotive Engineers, which currently announces that an SAE 140 gear lubricant is to replace the present SAE 110 and SAE 160 grades.

Over a year ago the lubricants division of the society, including technical men in both the oil and automotive industries, moved to reconsider the viscosity classification of transmission oils which resulted in the issuance of an entirely new classification, approved by the standards committee of the SAE last January.

When SAE classifications are changed, the old classification remains in force simultaneously with the new one for 18 months. Therefore, the old schedule including SAE 110 and SAE 160 retains its official status until July, 1939. It is expected refiners will immediately adopt the new classification and that during the next 18 months, practically all stocks of the old branding will have been consumed.

Because the SAE 140 grade replaces two old grades, the society points out that this, in a majority of cases, will not mean any actual change in lubricants now in existence. Most of the SAE 160 oils now on the market are within the viscosity range of the new SAE 140, according to the SAE, so that, in most instances the only actual change will be in the brand number.

The necessity for several different viscosity ranges in transmission lubricants has been recognized for a long time and the classification of these oils has proved reasonably satisfactory. However, there have been changes in the design of gearing, and increases in the speed of transmissions proportional to the increase in engine speeds, to say nothing of the entry of highly special types of lubricants into the field.

Previously, there have been five viscosity classes for transmission lubricants, and a special study of actual practice showed that this was an unnecessarily large number. Furthermore, according to the SAE, the old viscosity classification was based entirely upon 100 degrees F., whereas the basis upon which the use of different grades was recommended was principally a matter of selecting a grade considered to be best for the average temperature of use.

The society points out that this immediately suggested that a better classification could be based upon different temperatures. SAE 80 corresponds, more or less, in the rear axle and transmission classification, to the lightest grade of engine oil in engine oil classifications. It exists because a transmission lubricant really fluid at quite low temperatures is necessary, according to the SAE. Therefore, the committee felt that the logical thing was to pick a temperature at zero for classifying SAE 80.

The winter grade enjoying the widest usage is SAE 90, and after thorough consideration of several lower temperatures the committee concluded that every purpose would be served by classifying SAE 90 at 100 degrees F. Therefore in the new classification, SAE 90 remains the same as it has always been. SAE 80 is classified by a maximum viscosity at zero, which the SAE claims is far more reasonable.

Heavier than SAE 90 there were previously the three types—110, 160 and 250. These were all intended for normal summer operation. Since, today, transmission and rear axle temperatures are not a great deal less than those prevailing in the engine, a classification at 210 degrees is much closer to service temperature, the SAE points out.

This, therefore, was chosen for the new classification of summer lubricants. Furthermore, the committee's study showed there was no necessity for both the 110 and the 160 classifications. Therefore, these have been replaced by the new SAE 140. The society explains that it represents the most desirable characteristics of both these old classifications, in that the viscosity gradings are taken at temperatures more nearly corresponding to the temperature ranges for which they are recommended.

This new grade will simplify car manufacturers' recommendations and reduce the number of grades to be carried at filling stations.

SAE 250 is used to some extent in truck, bus and industrial service, but it is rarely used for passenger cars. It is probably used most frequently where provisions against leakage from the housing are not too good. Except for the fact that its minimum viscosity is now classified at 210 degrees instead of 100 degrees, the SAE 250 remains essentially unchanged.

The actual classification as it will appear in the 1938 SAE Handbook reads as follows:

"The SAE viscosity numbers for transmission and rear axle lubricants constitute a classification in terms of viscosity and of consistency at low temperatures only. Other factors of quality or character are not considered.

"The viscosity range and consistency at low temperatures for the several classes of transmission and rear axle lubricants are refined in the following table:

SAE Viscosity Number	Viscosity Range Saybolt Universal	Consistency—Must Not Channel in Service at Deg. F.
SAE 80	100,000 sec. at zero deg. F. max.	−20
SAE 90	800 to 1500 sec. at 100 deg. F.	0
SAE 140	120 to 200 sec. at 210 deg. F.	+35
SAE 250	200 sec. at 210 deg. F. min.	..

"In the case of SAE 80, the minimum viscosity limit is not specified, since this grade is specially for use at very low temperatures at which SAE 90 would be too heavy. The oil company furnishing the lubricant shall be responsible for maintaining a sufficiently high minimum viscosity to provide satisfactory lubrication. In a similar manner the maximum viscosity limit for SAE 250 is not specified since this grade is a special one for temperatures at which SAE 140 is too light. The oil company furnishing this lubricant shall be responsible for maintaining a sufficiently low maximum viscosity to provide satisfactory shifting of gears without channeling at the lowest temperature for which the lubricant is recommended.

"In the case of fluid greases made by adding soap or other thickening ingredients to oil, the viscosity number by which the lubricants are classified shall be determined by the viscosity of the oil before the addition of the soap or other thickening ingredients."

"The Science Of Petroleum"

Exhaustive Summary of World's Knowledge Of Oil

By ARCH L. FOSTER
N. P. N. Technical Editor

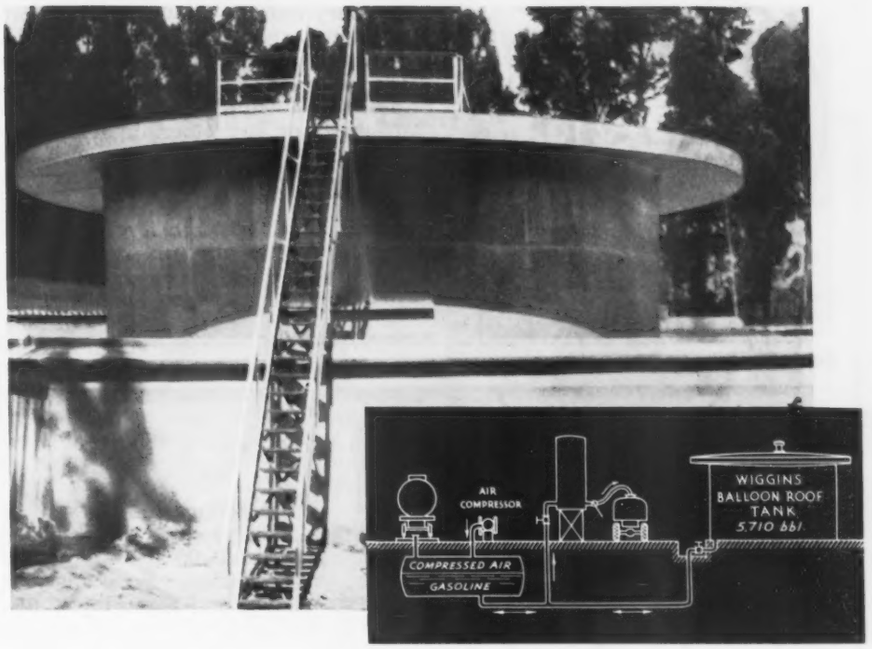
Seldom is it possible for a world industry to assemble within the pages of a few volumes all of the important facts of science, engineering and technology which have been discovered and developed by that industry over a period of even a few years. More seldom can that be done by the best of the engineers and chemists in several different countries, within a space of time short enough to avoid the charge of ancient history so often true of technological publications.

That is however the accomplishment to be placed to the credit of A. E. Dunstan, chief chemist of Anglo-Iranian Oil Co. and managing editor of "The Science of Petroleum", and his international staff of technologists. Dunstan himself is very widely known in the oil industry of America for his activities in refining technology the aggressiveness and progressiveness of his organization. Among other things he is a member of the American Petroleum Institute and honorary chairman of its division of refining, the meetings of which he has attended several times during recent years. In the fields of process and chemical development his is one of the most forward-looking organizations in the world of oil.

Aiding Dunstan were three other prominent chemists and engineers, Prof. A. W. Nash, head of the department of oil engineering and refining, University of Birmingham, England, well known author on refining subjects; who served as editor of contributions. Dr. B. T. Brooks, one of the best known of America's chemical engineers and author of several technological works of petroleum refining is editor for the U.S.A., whence came more than half the total number of authors. As consulting editor Sir Henry Tizard, rector of the Imperial College of Science and Technology, London was chosen.

This staff of internationally known technologists selected the authors for each of the 370-odd subjects covered in the four-volume, 3200-page work, supervised the assembly of data and edited the manuscripts, a tremendous job. From a brief study of the finished work no comparable assembly of information has ever been attempted in any world industry. The nearest approach to it appears to be some of the voluminous collections of chemical information published in Germany, such as Beilstein's compendium of organic chemicals.

The first 838-page volume is devoted entirely to geology and production engineering. The production and geology



The WIGGINS BALLOON ROOF for Bulk Station Tanks

The Wiggins Balloon Roof is particularly applicable to flat-bottom storage tanks used by marketing organizations. It prevents evaporation loss by being able to expand and make room for excess vapor which otherwise would be vented out to the atmosphere. It is simple and foolproof in principal and requires no more maintenance or attention than an ordinary roof.

A good example of the versatility of the unit is offered by the installation shown in the picture above. This is a 5,710-bbl. Wiggins Balloon Roof tank at a bulk station of the Anglo-Ecuadorian Oilfields, Ltd., in Quito, Ecuador. The tank measures 42 ft. in diameter, while the roof with its 6 ft. overhang is 54 ft. in diameter. The product being handled, in this case, is 73 gravity motor gasoline.

The diagram shows the plan of the station. Gasoline flows by gravity from the tank cars to an underground receiving tank from which it is forced by compressed air to either a small service tank or to the storage tank with the Balloon Roof. Although quite simple, this hook-up permits any desired movement of gasoline, and actual operating results show practically no vapor losses.

The money - saving features offered by Wiggins Balloon Roofs merit your careful investigation. Call or write our nearest office for complete information.

Chicago Bridge & Iron Company

Cleveland	2206 Rockefeller Bldg.	Dallas	1439 Liberty Bank Bldg.
Chicago	2125 Old Colony Bldg.	Birmingham	1534 N. Fiftieth Street
New York	3345—165 Broadway Bldg.	Houston	2919 Main Street
Philadelphia	1614—1700 Walnut Street Bldg.	Tulsa	1607 Hunt Bldg.
Boston	1516 Consolidated Gas Bldg.	San Francisco	1060 Rialto Bldg.
Detroit	1513 Lafayette Bldg.	Los Angeles	1422 Wm. Fox Bldg.

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of every country in which any oil production exists or which has been studied for oil possibilities has been discussed by one or more authors best acquainted with each area. For the engineer or any other interested person the whole subject has been covered exhaustively enough for any practical reference work.

Volumes 2 and 3 are devoted to properties of petroleum and its fractions; analysis and the types of petroleum found; refining processes and the technology of cracking, polymerization, hydrogenation, treating and the chemical and physical characteristics of hydrocarbons. Careful attention has been paid to the newer developments in refining processing, including solvent extraction, and separation of different products.

Better utilization of products and the manufacture of products better suited to both new and old uses is a field placed under more intensive study in the last decade, and this subject fills most of the fourth volume. The newer technology of automotitve and diesel fuels and the processing which improves them, the advances in scientific lubrication and the use of heavy fuels in more efficient ways are carefully treated. By-products and synthetic commercial materials are among the most interesting of petroleum products and are discussed in detail in many newer developments. Bituminous materials and their technology complete the fourth volume.

Altogether this huge work will prove indispensable not only to the oil engineer, technologist and chemist, but to all individuals and companies interested in a complete reference work covering literally the entire world of petroleum. For this purpose these volumes represent the concentration of fundamental knowledge in every one of the many branches of the industry, from the paleontologist attempting to identify structures for their oil possibilities, to the oil jobber concerned with the properties of finished products and how they may be best utilized.

"Clean Up–Spruce Up" Contest For April Offered Dealers

● "Soap, water and elbow grease" are the only requirements for entering a "Clean Up—Spruce Up" campaign which the Republic Oil Co., Pittsburgh, will conduct among its dealers and its jobbers' dealers during April. Even fresh paint will not be a deciding factor, the company stated.

The announcement of the contest states that the dealer can win two ways, one by new customers which the contest will develop and the other through cash prizes the company is offering.

First prize of $10 and second prize of $5 will be awarded to dealers with the cleanest stations in each of the company's seven divisions. In addition, a grand prize of $10 will be awarded at the close of the contest to the dealer with the station judged cleanest in all divisions.

According to the plan, Republic's division managers will select winning stations in their territories. Pictures will be taken of these stations and submitted to the company's executive committee in Pittsburgh with a letter from each division manager describing the winner in his territory. From these photos and letters the committee will decide the grand prize winner.

To assist dealers in putting their stations in shape for the contest, the company's announcement includes an itemized "Easy Check Sheet" for quickly noting the appearance of the station. At the outset, this sheet suggests the dealer walk to his station from a half block away on the main traffic flow to the station and that he put himself in the place of a stranger approaching the station. The dealer is then asked to observe the outside premises first—then go inside and inspect the rest rooms, office and lubritorium —and finally the appearance of uniforms and attendants.

Following is the check sheet which Republic offers its dealers as contest assistance:

Exterior

1. Are there too many signs up?
2. Are those displayed, balanced and well placed?
3. Are they wiped clean?
4. Is Easel (A-Board) in place and displaying current poster?
5. Is the drive free from refuse?
6. Is drive free from oil spots and grease?
7. Were pumps and globes wiped clean this morning?
8. Are water buckets full—in place and ready for use?
9. Is pump island clear for quick efficient service to motorist?
10. Is island display case clean and in order?
11. Is gravel on drive raked smooth?
12. Is the outside of station window glass clean?
13. Is lighting system in order?

Interior

1. Are wash rooms clean?
2. Have instructions been issued to inspect wash rooms each hour, or 3 times daily?
3. Are inside of glass windows clean?
4. Are light bulbs and shades clean?
5. Are the goods in stock free from dust and well arranged?
6. Are floors clean?

7. Is desk woodwork and other interior woodwork clean?
8. Is office desk orderly?
9. Are map and printed matter display racks clean, filled with material and in order?
10. Are accessories free from dust, clean and well arranged?

Lubrication Room

11. Is floor (or pit) reasonably clean?
12. Are tools clean, in place and orderly?
13. Are stocks of oils and greases clean and in order?

Attendants

14. Are all clean-shaven? Do face and hands present a clean appearance?
15. Does cap and coverall present a cleanly appearance?
16. Are shoes reasonably well polished?
17. Are neckties worn?
18. Are all in uniforms?

Nebra. Stations Protest 'Beautification' Plans

LINCOLN, March 31.—Federal highway beautification plans involving certain service stations along US Route 6, near Lincoln, have been stopped by a district court restraining order and plans may be altered to eliminate the objections of the dealers.

The project called for erecting posts, extending three feet above ground, lining the driveways at service stations and other places of business.

Retailers objected, stating the posts might give potential customers the impression driveways were blocked. A compromise may be to shorten the posts and intersperse shrubbery, to avoid giving the appearance of a closed station.

The Nebraska Petroleum Marketers, Inc., in reporting the incident in a current bulletin, warns retailers throughout the state to be alert, as similar highway beautification projects are reported to be under way over the state.

Lakes Traffic Report

Petroleum receives scant attention in a newly published 440-page report on Great Lakes navigation by the War Department, Board of Engineers for Rivers and Harbors.

Major portion of the volume is devoted to grain, iron ore, and coal. The report covers connecting channels and harbors and gives information on laws, treaties, and regulations of navigation and traffic. It also shows the historical development of commerce and shipping on the lakes.

Petroleum is covered in three pages. Tables give 1935 movements of oil and a general summary table shows growth since 1919. Copies of the report, entitled "Transportation on the Great Lakes", may be secured for $1.75 from the Superintendent of Documents, Washington.

Curtis Lifts

SELL UNDER-CAR SERVICE

Customers can see what is needed when you get their cars up on a Curtis Lift. With visible evidence, it is easy to sell them many profitable under-car repairs, such as:

brake adjustments • brake lining • muffler replacement • spring repairs • shock absorber adjustment • wheel alignment • tire service • steering linkage • tappet adjustments • chassis tightening • rear end overhaul • front end service

This is all *plus*-usefulness in addition to lubrication, for which Curtis Lifts are unsurpassed. Your men can work more efficiently and with less fatigue standing upright in good light than in a messy, cramped, poorly lighted pit. Also, you avoid the health, fire, explosion and accident hazards of the pit.

THESE FEATURES MAKE YOUR LIFT DOLLAR GO FARTHER WITH CURTIS:

- COMPLETE ACCESSIBILITY—every chassis point easily reached
- HANDLES ALL CARS—any make, any model
- SELF-LEVELING PLATFORM—won't stick coming down
- DROP-AWAY WHEEL GUIDES—automatically center car
- ABSOLUTE SAFETY—oil-locked, 4-ton capacity

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1,000 OIL MEN
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225 So. 15th St. Philadelphia, Pa.

Ohio Jobber Wholesales Tires, Batteries, Accessories

EACH MORNING two delivery trucks drive out of Lima, Ohio, into the surrounding trade territory, calling on garages and service stations to sell tires, batteries and accessories. They are part of the sales and delivery system of the accessory wholesale division of the Parks-Klay Co., independent oil jobber.

In addition to its wholesale tire, battery and accessory business the company has retail distribution through its service stations and a one-stop station in Lima.

Wholesaling of automotive merchandise was started when the company took on the present one-stop station. Before 1930 the company sold accessories through its service stations at retail. When the one-stop station was acquired retail selling was continued, the accessory department expanded into the wholesale end of the business and the company began buying at wholesale.

At first a small panel job truck was placed on wholesale sales. Now the company operates two units, 1½ ton delivery jobs. Its territory is roughly divided between the trade area south, and the area north of Lima, covering a territory about 35 miles out of the city.

The two wholesale salesmen are paid a salary, plus commission. Garages are the best wholesale accounts, followed by dealer operated service stations handling gasoline brands other than that distributed by Parks-Klay.

The wholesale salesmen operate out of Lima, and the trucks are in the city each night. In the morning they are re-stocked at the company's one-stop station and take to the road.

The company's entire accessory stock, including tires and batteries, is kept at the one-stop station. The company's office is in the second floor of this building.

Credit department work for the two wholesale salesmen is kept to a minimum. The men are to spend their time making sales. This has been accomplished by the credit department thoroughly explaining to accounts that statements are to be paid when issued, and constantly keeping such statements paid.

Stock room for tires of the Parks-Klay Co. at Lima, O. The company, which wholesales tires, batteries and accessories, keeps a tire inventory of about $10,000. The stock room is located in the basement of the company's one-stop station at Lima, the accessories stock being located in an adjoining room

The accessory inventory is stored in the basement of the one-stop station, except batteries. Batteries are on shelves in the station's battery department. Tires, on which the inventory is about $10,000, are kept in one basement room, the accessories in another room.

In retail selling the company's service stations carry a nominal inventory at all times, and the main stock is beneath the sales floor at the one-stop station.

One of the two delivery trucks of the Parks-Klay Co. that leave headquarters each morning to call on wholesale accounts to sell tires, batteries and accessories

Responsibility for selling in the one-stop station is divided among the various salesmen. All salesmen receive a salary plus the commission on sales in their department. Salesmen are employed for a definite sales department. Some salesmen are on gasoline, others are selling tires, others batteries, and others sell lubrication service.

The Parks-Klay company holds four sales meetings each year for the entire sales organization, including dealers. There are two meetings on gasoline, one on tire selling in the spring, and the other on batteries in the autumn.

The Texas Corp. Earned $54,574,319 In '37

CLEVELAND, April 2.—Consolidated net profit for 1937 of The Texas Corp., after all charges, totaled $54,574,319, according to the company's annual report, compared with $38,260,341 in 1936.

The 1937 net earnings were equal to $5.02 per share compared with $4.10 per share, on a smaller number of shares, the previous year. Dividends at the rate of $2.25 per share totaled $23,319,728.

The report calls attention to the nation's stocks of motor fuel on hand December 31, 1937, which represented 61 days' supply, compared with 51 days' supply at the end of the previous year and the highest year-end stocks on record.

Gross crude oil production of the corporation's subsidiaries aggregated 60,476,616 barrels in 1937, compared with 53,854,116 barrels in 1936 and 45,706,585 in 1935. Total acreage held amounted to 10,247,544 acres exclusive of land held jointly with Socony-Vacuum Oil Co., Inc., in South America and Standard Oil Co. of California in the Far East.

Pipeline subsidiaries delivered 101,109,681 barrels of crude oil, compared with 92,847,010 in 1936. Crude runs to stills totaled 96,303,115 barrels. A total of 87,957,545 barrels were run the previous year.

As in last year's report, the company pointed out that the petroleum industry pays 11 per cent of the nation's tax bill, whereas the capital investment in the petroleum industry is only 4.5 per cent of the nation's total. Taxes paid by The Texas Corp. amounted to $3,365.07 for each employe, domestic and foreign, on the payroll of the corporation and its subsidiaries, or a total of $104,909,408.

Well In Gulf of Mexico

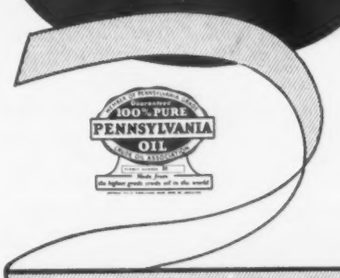
TULSA, April 2.—Considerable interest was aroused in the Southwest recently by the bringing in of the first oil well off the open coast of the Gulf of Mexico. Other wells which have been drilled in the Gulf are located in bays.

The new well is the Superior Oil Co.'s No. 1 State in the Gulf of Mexico, located about 1.5 miles off shore and about 35 miles south of Lake Charles, La. The lease is held jointly by the Superior company and the Pure Oil Co.

The well reached the sand at 5110 feet and was drilled to 5130 feet. It flowed at the rate of approximately 600 barrels a day through chock. The derrick floor was 24 feet above the water line, and the water was 13 feet deep at the operating point.

Leases are said to cover 42,000 acres in the newly discovered Creole field, with the No. 1 well in the center of the block.

Sell a Quality PRIVATE BRAND packed by FREEDOM



Build yourself sound goodwill by marketing the world's best grade motor oil under your own name. Our refinery is equipped to pack and seal a variety of oils—all refined from 100% pure Pennsylvania grade crude—in jobbers' own private brand cans. • Write today for prices and for information on Freedom brands available for exclusive marketing.

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Established 1893

PEERLESS MOTORS

Tank Wagon Prices Are Lower In April-June Contracts

N. P. N. News Bureau

WASHINGTON, April 2.—Government agencies buying their tank wagon requirements of V-68 (regular) gasoline under the Treasury Procurement Division contracts for the April-June quarter will generally pay less than they did during the January-March quarter, an analysis of TPD awards for the 42 "city zones" indicates.

In contracts for 39 out of the 42 "city zones" the April-June prices were lower than prices for the January-March quarter, which prices, in turn, were lower than for October-December, the previous quarter.

Contracts for the federal business in two cities—Chicago and Omaha—were at slightly higher prices, while the Birmingham contract for April-June was at exactly the same price as for the preceding quarter.

It was not only the major oil companies which quoted lower prices to the government purchasing agency; several of the lowest-priced contracts went to Independent oil marketers.

The government is given, in these contracts, the alternative of buying on a posted price basis or at guaranteed maximum or top price. In the eastern and some southern cities, the posted price basis was commercial consumer tank car, while elsewhere it was commercial consumer tank wagon.

There were several instances of contracts for tank wagon delivery at flat tank car price. Discounts off tank wagon prices in other cities ranged up to 3.1 cents. For several Ohio cities, Standard of Ohio quoted 2.875 cents off consumer tank wagon, as against 2.5 cents off in the January-March contracts.

Maximum prices of less than 7 cents for house-branded regular gasolines appear in contracts for Philadelphia, New York, Brooklyn, Kansas City, and other cities.

The Philadelphia contract, with estimated requirements of 191,000 gallons, went to The Petrol Corp., a Philadelphia jobber, who bid tank car flat for tank wagon delivery, with a maximum price of 6.71 cents. In other words, if, on the date of delivery, Petrol's posted consumer tank car price is less than 6.71 cents, then the government will be billed at the tank car price. But in no case may the price be more than 6.71 cents.

The federal business in Kansas City was won by Phillips Petroleum Co., with a maximum price of 6.7 cents. Estimated requirements were 34,000 gallons.

Contracts for New York, Brooklyn, Flushing and Jamaica went to Cities Service Asphalt Products Co. (formerly Warner-Quinlan) at 6.9 cents.

Three of the four West Coast "city zones" were contracted for at prices of better than 9 cents, which was considerably higher than in other sections. None of the eastern cities' contracts were for as much as 8 cents. Cities in other sections were generally above the price level of the eastern cities, but lower than those on the West Coast.

Tabulated herewith is a summary of April-June contracts for the 42 city zones, showing estimated gallonages for the three-month period, contractor's name, posted price basis, maximum price and brand name.

Berrys afford the independent jobber an opportunity to purchase quality material of all descriptions at competitive prices, assuring prompt deliveries and a workable margin.

Our diversified shipping points are your assurance of a definite source at all times.

Your inquiries for kerosene, furnace and fuel oil, as well as gasoline and all kinds of lube oils, will be greatly appreciated.

JAMES B. BERRY SONS' CO., INC. OIL CITY, PA.

Branch Offices: New York City; Chicago, Ill.; Boston, Mass.; Philadelphia, Pa.; Houston, Texas; London, England; Hamburg, Germany; The Hague, Holland.

Refineries: Oil City, Pa.; Emlenton, Pa.; Farmer's Valley, Pa.; St. Mary's, W. Va.
Ocean Terminals: Baltimore, Md.; Tiverton, R. I.; Dorchester, Mass.; Carteret, N. J.; Edgewater, N. J.; Glastonbury, Conn.; Philadelphia, Pa.

TANK WAGON GASOLINE AWARDS IN CITIES, APRIL-JUNE QUARTER

(All contracts awarded are for V-68 grade of motor fuel, corresponding generally to "regular" grade, with minimum of 68 octane. Volume figure is gallons.)

BRIDGEPORT, Conn., 10,350; Sinclair (tank car plus .5 cent) 7.3 cents for "H-C."

NEW HAVEN, Conn., 12,054; Connecticut Refining Co., West Haven, Conn., (tank car flat) 7.25 cents for "Benzoline."

BALTIMORE, 62,760; Standard of N. J., (tank car flat) 7.22 cents for "Essolene."

WORCESTER, Mass., 9,300; Colonial Beacon (tank car plus .5 cent) 7.73 cents for "Essolene."

BOSTON, 130,750; Colonial Beacon (tank car flat) 7.03 cents for "Essolene."

JERSEY CITY, N. J., 22,000; Sinclair (tank car flat) 7.0 cents for "H-C."

NEWARK, N. J., 30,255; Sinclair (tank car flat) 7.0 cents for "H-C."

BUFFALO, 56,482; Sinclair (tank car plus .38 cent) 7.87 cents for "H-C."

ROCHESTER, N. Y., 20,251; Sinclair (tank car plus .38 cent) 7.8 cents for "H-C."

BROOKLYN, 117,304; Cities Service Asphalt Products Co., New York City, (tank car plus .25 cent) 6.9 cents for "Koolmotor."

FLUSHING, N. Y., 15,000; Cities Service Asphalt Products Co. (tank car plus .25 cent) 6.9 cents for "Koolmotor."

JAMAICA, N. Y., 8,674; Cities Service Asphalt Products Co. (tank car plus .25 cent) 6.9 cents for "Koolmotor."

NEW YORK CITY, 291,562; Cities Service Asphalt Products Co. (tank car plus .25 cent) 6.9 cents for "Koolmotor."

PITTSBURGH, 48,700; American Oil Co., (tank car flat) 7.97 cents for "Orange American."

PHILADELPHIA, 191,000; The Petrol Corp., Philadelphia (tank car flat) 6.71 cents for "Koolmotor."

PROVIDENCE, R. I., 18,550; Texaco (tank car flat) 7.3 cents for "Fire Chief."

BIRMINGHAM, Ala., 13,220; Texaco (tank wagon less 3 cents) 8.4 cents for "Fire Chief."

JACKSONVILLE, Fla., 9,350; Standard of Ky. (tank wagon less 3 cents) 7.5 cents for "Crown."

MIAMI, Fla., 22,550; Standard of Ky. (tank wagon less 3 cents) 7.5 cents for "Crown."

ATLANTA, 12,886; Sinclair (tank wagon less 3 cents) 9.2 cents for "H-C."

MEMPHIS, Tenn., 26,864; Sinclair (tank car plus .5 cent) 8.15 cents for "H-C."

RICHMOND, Va., 4,450; Texaco (tank car flat) 7.7 cents for "Fire Chief."

NORFOLK, Va., 91,400; Texaco (tank car flat) 7.5 cents for "Fire Chief."

CHICAGO, 248,181; Wells Petroleum Co., Chicago (tank wagon less 2.23 cents) 7.07 cents for "Welco Anti Knock."

INDIANAPOLIS, 29,373; Associated Service Co., Louisville, Ky. (tank wagon less 2 cents) 8.4 cents for "Ethyl."

DES MOINES, Iowa, 10,000; Phillips (tank wagon less 1.5 cents) 7.8 cents for "66."

LOUISVILLE, Ky., 15,200; Indian Refining Co. (tank wagon less 3 cents) 8.65 cents for "Fire Chief."

GRAND RAPIDS, Mich., 9,065; Texaco (tank wagon less 1.5 cents) 8.64 cents for "Fire Chief."

DETROIT, 145,860; Standard (tank wagon less 1.5 cents) 8.1 cents for "Red Crown."

MINNEAPOLIS, 48,400; Western Oil & Fuel Co., Minneapolis, (tank wagon less 1.5 cents) 7.88 cents for "Husky."

ST. PAUL, Minn., 25,500; Blau Oils Inc., Minneapolis, (tank wagon less 1.5 cents) 8.23 cents for "Phillips 66."

KANSAS CITY, Mo., 34,000; Phillips (tank wagon less 1.5 cents) 6.7 cents for "66."

ST. LOUIS, 61,500; Fuel Oil Co. of St. Louis, (tank wagon less 3.62 cents) 7.28 cents for "Skelly Aromax."

OMAHA, Neb., 16,500; Phillips (tank wagon less 1.5 cents) 7.8 cents for "66."

TOLEDO, 14,294; Standard of Ohio (tank wagon less 2.875 cents) 8.125 cents for "Sohio X-70."

CLEVELAND, O., 47,561; Standard of Ohio (tank wagon less 2.875 cents) 8.125 cents for "Sohio X-70."

CINCINNATI, 37,908; Powerful Petroleum Co., Cincinnati, (tank wagon less 3.1 cents) 7.9 cents for "Super Pepper."

COLUMBUS, O., 22,053; Standard of Ohio (tank wagon less 2.875 cents) 7.125 cents for "Sohio X-70."

MILWAUKEE, 42,513; Texaco (tank wagon less 1.5 cents) 7.85 cents for "Fire Chief."

DALLAS, 24,748; Sinclair (tank wagon flat) 7.8 cents for "H-C."

SAN ANTONIO, 16,920; Texaco (tank wagon flat) 8.85 cents for "Fire Chief."

DENVER, 17,500; The Navy Gas & Supply Co., Denver, (tank wagon less 2 cents) 8.7 cents for "Super Shell."

SAN FRANCISCO, 147,055; Union Oil Co. of Calif., Los Angeles (tank wagon less 3 cents) 9.24 cents for "76."

OAKLAND, Calif., 65,920; Union Oil Co. of Calif., (tank wagon less 3 cents) 9.24 cents for "76."

LOS ANGELES, 500,233; Standard of Calif. (tank wagon less 3 cents) 8.6 cents for "Standard."

SEATTLE, 44,100; Union Oil Co. of Calif. (tank wagon less 3 cents) 9.74 cents for "76."

CONTRACT PRICES FOR FEDERAL GASOLINE BUSINESS, 1937-38

	Jan.-Mar. 1937	April-June 1937	July-Sept. 1937	Oct.-Dec. 1937	Jan.-Mar. 1938	April-June 1938
Bridgeport	7.4	7.45	7.5	7.95	7.6	7.3
New Haven	7.35	7.45	7.95	8.35	7.45	7.25
Baltimore	7.22	7.47	7.74	8.15	7.75	7.22
Worcester	7.0	8.0	8.25	8.25	8.25	7.73
Jersey City	6.79	7.41	7.23	7.94	7.75	7.0
Newark	6.79	7.41	7.23	7.94	7.75	7.0
Buffalo	7.71	8.3	8.97	9.0	8.49	7.87
Rochester	7.78	8.48	8.74	9.0	8.47	7.8
New York City	7.04	7.5	7.6	7.9	7.39	6.9
Brooklyn	7.04	7.5	7.6	7.9	7.39	6.9
Jamaica	7.04	8.0	7.9	7.9	7.43	6.9
Flushing	7.04	8.0	7.9	7.9	7.43	6.9
Pittsburgh	8.35	8.2	8.1	8.75	8.7	7.97
Providence	6.79	7.5	7.75	8.0	7.9	7.3
Boston	6.5	7.4	7.6	7.83	7.55	7.03
Philadelphia	6.79	6.95	7.5	7.75	7.48	6.71
Memphis	8.0	8.49	9.0	9.5	9.0	8.15
Richmond	7.75	8.13	9.8	9.3	8.8	7.7
Norfolk	7.66	7.8	9.5	9.5	8.75	7.5
Chicago	7.5	7.75	8.3	7.12	6.97	7.07
Indianapolis	9.11	9.8	9.6	9.0	8.7	8.4
Des Moines	9.0	9.0	9.0	8.5	8.0	7.8
Louisville	8.0	9.5	10.0	9.9	8.875	8.65
Grand Rapids	9.6	10.0	9.9	9.45	8.9	8.64
Detroit	9.0	9.0	9.1	8.45	8.45	8.1
Minneapolis	9.3	9.6	9.5	9.02	8.48	7.88
St. Paul	9.3	9.6	9.5	9.02	8.48	8.23
Kansas City	8.5	8.22	7.985	7.15	6.875	6.7
St. Louis	7.89	8.19	8.4	7.99	7.545	7.28
Omaha	8.74	8.73	8.73	8.43	7.77	7.8
Toledo	9.0	9.5	10.5	9.5	8.95	8.125
Cleveland	9.7	9.5	10.5	9.5	8.95	8.125
Cincinnati	8.5	9.5	10.0	9.125	8.5	7.9
Columbus	9.0	10.5	9.5	8.5	8.0	7.125
Milwaukee	8.4	9.0	8.7	8.15	8.15	7.85
Birmingham	7.5*	8.39*	8.85	8.5	8.4	8.4
Jacksonville	6.8*	8.0*	7.75	7.75	7.7	7.5
Miami	8.1*	8.1*	7.5	7.75	7.73	7.5
Atlanta	8.0*	9.5*	9.8	9.75	9.5	9.2
San Antonio	8.0*	8.0*	9.3	9.0	9.0	8.85
Dallas	9.37*	8.0*	8.7	8.3	8.0	7.8
Denver	8.9*	9.25*	9.75	9.6	8.85	8.7
** San Francisco	6.48*	....	10.5	10.5	10.0	9.24
** Oakland	6.48*	....	10.5	10.5	10.0	9.24
** Los Angeles	7.5*	....	10.0	9.75	9.5	8.6
** Seattle	7.1*	....	10.9	11.0	10.5	9.74

* G-101 (Third) Grade.

** Above cities had 12-month contracts awarded July 1, 1936, for G-101 gasoline. Contract prices for this period are given in first column.

ICC Approves Pressed-Flanges For Drums

CLEVELAND, April 2. — A petition to forbid the use of pressed-in flanges (a drum closure which encloses and contains the threaded bung) on Interstate Commerce Commission Specification 5 steel drums has been denied by the commission.

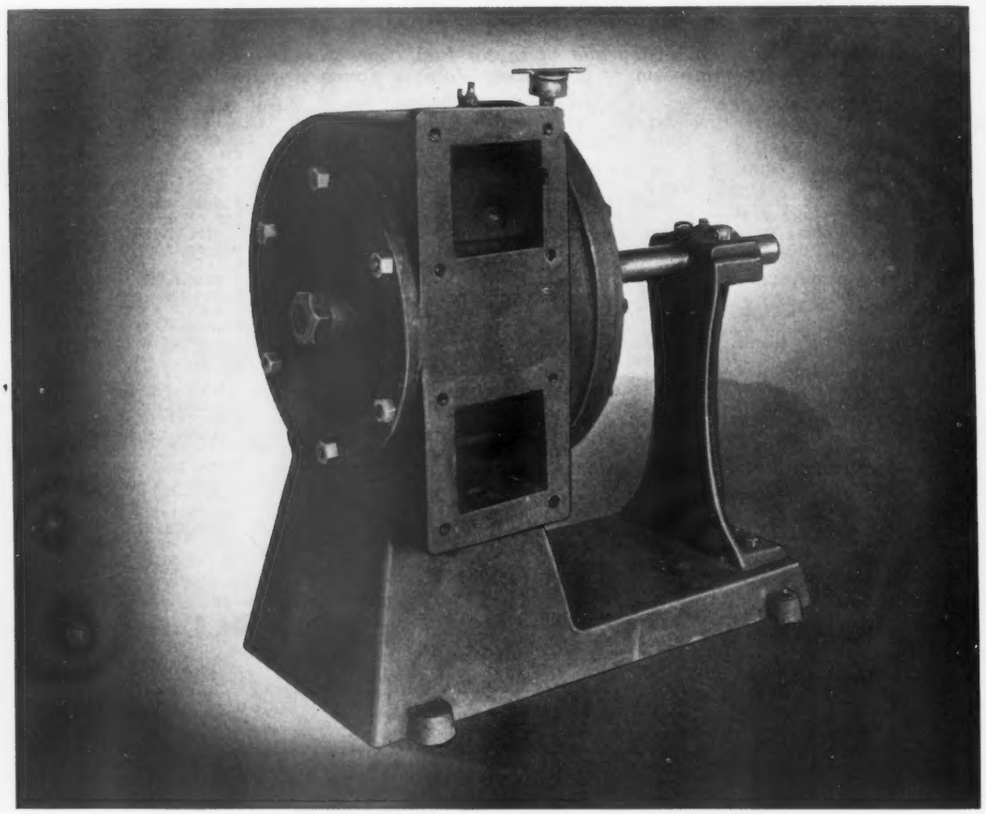
The proposed change was found to be unjustified in view of the fact that "the use of such flanges has not been shown to be in conflict with the best known practicable means for securing safety in transit of liquids or solids", it was stated. These drums are commonly used in the transportation of gasoline.

The change was proposed by the Manufacturing Chemists Assn. This association favored the permissible use of only welded-on or brazed flanges, which are admittedly stronger than pressed-in flanges. Opposition, led by the American Flange & Mfg. Co., Chicago, pointed out that the drop tests employed were too severe and beyond actual expectation in service. Lack of complaint from sales of 100,000,000 pressed-in type flanges was presented as evidence of satisfactory service of drums so equipped.

Seek To Broaden Market for Gas

NEW YORK, April 2.—American Gas Ass'n. is launching a nation-wide campaign to include automatic gas cooking and house heating equipment in the "millions" of homes built or modernized under new liberal financing arrangements of the federal housing law, the A. G. A. announces.

It is planned to have "liberty" homes, featuring the latest in gas appliances, built in each community by the local utility. More than 1500 local gas companies will co-operate, it was said. Thousands of dollars in prize money will go to architects and builders participating. National publicity is planned.



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of over 600,000 Viking Rotary Pumps

Gentlemen, meet the "Granddaddy" of all Viking Rotary Pumps. Built in 1907, the old fellow is today pensioned away in a corner of the Viking Plant . . . still mechanically good, still capable of a full day's work. A little old-fashioned we'll admit, but designed with the same unique pumping principle that has been built into more than 600,000 Viking Rotary Pumps; the same principle that has been copied by more rotary pump manufacturers than any other style.

For more than a quarter of a century Viking has furnished thousands of pumps to the Petroleum Industry . . . ranging from the small Bulk Station models to big, sturdy Marine Terminal and Cargo Units. Viking preference has grown to the point, where today, more Viking Rotary Pumps are used in the handling of petroleum products than any other make. We've put all the facts and figures in a handy bulletin—write for your copy today.

VIKING PUMP COMPANY
CEDAR FALLS, IOWA

Markets

At A Glance . . .

MID-WESTERN: Gasoline demand slows down; prices steady.
MID-CONTINENT: Contract gasoline shipments hold up well.
EASTERN: Majors advance New England gasoline 0.5 cent.
PENNSYLVANIA: U. S. Motor down 0.25; 65 octane up 0.125.
GULF: Roumania factor again in foreign trade.
CALIFORNIA: Light burning oils down 0.5 to 1 cent.

Mid-Western

N. P. N. News Bureau

CHICAGO, April 4. — Gasoline demand the last week of March was comparatively light following the previous week's scurry to beat the freight rate increase. Marketers generally expressed the opinion that it will be from 10 to 15 days before demand returns to the seasonal normal.

New purchases of gasoline generally were light as buyers endeavored to obtain material placed in transit prior to the freight rate advance. Reports indicated continued scarcity of low octane gasoline. Prices for all grades generally remained steady.

Kerosine inquiry also eased off somewhat last week, resale agents stated, after comparatively heavy shipments the previous week. One local refiner reported sales of two 10-car lots of kerosine after the freight rate increase, but said that these sales were exceptional. Prices generally were steady. Marketers anticipated continued active inquiry from the farm trade.

Michigan refiners reported small inventories of straight run gasoline as demand continued active. Higher octane gasoline also were active although supplies of these grades were reported more plentiful. Prices for all grades generally were unchanged.

Tractor fuel and kerosine demand increased considerably the past week, Michigan refiners reported, as preparations for spring plowing got under way.

Range oil shipments continued to decline, reports indicated.

Mid-Continent

N. P. N. News Bureau

TULSA, April 4. — After the rush of "freight rate" buying of two weeks ago, Mid-Continent refiners the past week settled down to supplying jobbers' routine gasoline requirements.

Most refiners expected a definite lag in buying after March 28, when advanced freight rates became effective. But most of them reported a surprisingly large amount of orders against contracts, and a few open market orders. Three factors contributed to continued near-normal gasoline demand.

Several refiners said many of their jobbers were unable to "stock up" before higher freight rates advanced their delivered costs. Orders from these jobbers reflected increased consumption. More general use of third grade gasoline for tractor fuel was another factor that kept gasoline orders from slumping drastically.

Gasoline shipments to Ohio jobbers were stimulated late last week by Sohio's announcement of a 0.5-cent increase in gasoline prices April 3. After the deluge of shipping instructions two weeks ago, few Mid-Continent refiners said they had much gasoline to offer. Prices were steady.

Texas Grade 26-70 natural gasoline was closely held. Bids 0.125 cent above the previous week's prices failed to bring out new offerings, buyers said. Oklahoma prices were unchanged.

Prefaced by spring rains, plowing in many sections was getting underway, and increased demand for kerosine and tractor fuel was reported by many refiners.

N. P. N. Refinery Index

The Refinery Index shown below is the calculated average return from refining a barrel of 36 gravity Mid-Continent crude into its various principal products at the current price of crude oil. The index indicates the following margins in cents per barrel between cost of crude and current selling price of products.

Date	Margin
April 4	39.2
Month ago	32.2
Year ago	55.4

N. P. N. Gasoline Index

	Dealer T.w. Cents per	Tank Car Gal.
April 4	10.24	5.96
Month ago	10.11	5.85
Year ago	10.67	6.55

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 12 wholesale markets for regular-grade gasoline.

Eastern

N. P. N. News Bureau

NEW YORK, April 4. — The 0.5-cent increase in tank car and tank wagon gasoline prices throughout New England, with the exception of Connecticut, March 30 by the Socony-Vacuum Oil Co. featured gasoline markets along the eastern seaboard the closing days of March.

Virtually all major companies marketing in this area had met the advance by April 1, according to reports here.

Traders in the Boston area, where unsettled retail and tank car markets have prevailed for some time, generally were at loss to account for the advance. Several felt that the advance was made in an attempt to clear up the unsettled wholesale and retail condition.

The advance in New England served temporarily at least to buoy the spirits of sellers in the New York market. That the effect was only temporary was seen in the increase of reports of low priced offers on the first and second of April.

Reports of 70 octane gasoline being offered over a period at 5.875 to 6 cents in barge lots by New York sellers were encountered as the week ended.

Lower priced offerings in the Philadelphia and Baltimore markets also were heard late in the week.

Pennsylvania

N. P. N. News Bureau

CLEVELAND, April 4. — Slight reaction in U. S. Motor gasoline prices in the lower field featured the western Pennsylvania refinery market the last week of March. Kerosine and fuel oil continued their recent downward trend with prices off 0.125 to 0.25 cent a gallon. Lubricating oils were quiet and there were widespread reports of price shading.

Desire of some resale agents to move gasoline which they were long, before the end of the month, was said to have caused the reaction in lower field U. S. Motor prices. The market had reached 5 cents and, according to reports, prices appeared to be fairly well held at this level. Some refiners reported several small-lot sales at this figure. Late the past week, however, a fairly substantial volume of material was offered at 4.75 cents by resale agents to obtain movement before the month-end, and at least one refiner reported meeting this competition.

On the other hand, the 65 octane

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline *and* Naphtha

Prices Effective	April 4	Mar. 28
OKLAHOMA		
U. S. Motor: (Octane Test L-3)		
62 oct. & below	4.375– 4.50	4.375– 4.50
63-66 oct.	4.625– 4.75	4.625– 4.75
67-69 oct.	4.875– 5.00	4.875– 5.00
70-72 oct.	5.25 – 5.50	5.25 – 5.50
60-62, 400 e.p.	4.25 – 4.50	4.25 – 4.50
WESTERN PENNA.		
Bradford-Warren:		
Motor gasoline:		
U. S. Motor (58-62°)	5.125	5.125
Min. 65 oct.	6.50 – 7.00	6.50 – 7.00
Other districts:		
54-56 naphtha	4.875– 5.00	4.875– 5.00
Motor gasoline:		
U. S. Motor (58-62°)	5.00 – 5.125	5.00 – 5.125
Min. 65 oct.	6.25 – 6.50	6.25 – 6.50
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis, for shipment within Michigan. Shipments, however, may originate at plants outside Central group).		
Str.-Run Gasoline	(d) 5.00 –5.50	(d) 5.00 –5.50
U. S. Motor: (Octane Test L-3)		
67-69 octane	7.75	7.75
70-72 octane	8.00 – 8.25	8.00 – 8.25
(d) Excluding Detroit shipment.		
CALIFORNIA (3c tax to be added to prices if used in state)		
U. S. Motor:		
54-58, for instate shipment	7.75 – 9.25	7.25 – 9.25
54-58, for outside state shipment	7.625– 9.00	7.50 – 9.00
58-61, 375-400 e.p., 65 oct. & above	8.25 – 9.75	8.00 – 9.75
(c) N. TEX. (For shipment to Texas and N. Mex. destinations; Group 3 prices quoted on northern shipments)		
U. S. Motor: (Octane Test L-3)		
62 oct. & below	(a) 4.50 –4.75	(a) 4.50 –4.75
63-66 oct.	(a) 5.00 –5.50	(a) 5.00 – 5.50
67-69 oct.	(a) 5.375–5.625	(a) 5.375–5.625
70-72 oct.	(a)5.625	(a)5.625
60-62, 400 e.p.	(a)4.625	(a)4.625
KANSAS (For Kansas destinations only)		
U. S. Motor: (Octane Test L-3)		
62 oct. & below	4.625– 4.75	4.50 – 4.75
70-72 oct.	5.50 – 5.625	5.50 – 5.625
(c) W. TEX.		
U. S. Motor: (Octane Test L-3)		
62 oct. & below	4.75 – 5.00	4.75 – 5.00
63-66 oct.	5.25 – 5.50	5.25 – 5.50
67-69 oct.	5.625– 5.875	5.625– 5.875
70-72 oct.	6.00 – 6.25	6.00 – 6.25
(c) E. TEX.		
60-62, 400 e.p.	(a)4.50	(a)4.50
N. LA. (For shipment within La. & into Ark.)		
U. S. Motor: (Octane Test L-3)		
62 oct. & below	4.25 – 4.50	4.25 – 4.50
63-66 oct.	4.75 – 4.875	4.75 – 4.875
67-69 oct.	4.875– 5.00	4.875– 5.00
70-72 oct.	5.375– 5.50	5.375– 5.50
ARKANSAS (For shipment within Ark. & into La.)		
U. S. Motor: (Octane Test L-3)		
62 octane & below	(b)4.50	(b)4.50
67-69 oct.	(b)5.00	(b)5.00
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	8.00	7.875
Above 65 oct.	8.25	8.125

Natural Gasoline

(Prices are those to blenders on freight basis shown below. Shipments, however, may originate in other Mid-Continent manufacturing districts, such as Panhandle Texas, S. W. Texas or Kans.)

F.O.B. GROUP 3		
Grade 26-70	2.50	2.50 – 2.625
F.O.B. BRECKENRIDGE		
Grade 26-70	2.625	2.50
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	7.50	7.25 – 7.50

(a) Nominal.
(b) Only one refiner quoting.
(c) Refiners report they generally receive from 0.25c to 0.5c per gal. more for gasoline & kerosine for local or differential territory shipment.

Kerosine

Prices Effective	April 4	Mar. 28
WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.125– 5.375	5.25 – 5.375
46 w.w.	5.125– 5.50	5.375– 5.50
47 w.w.	Prices Disctd.	5.50 – 5.625
Other districts:		
45 w.w.	5.00 – 5.25	5.00 – 5.25
46 w.w.	5.125– 5.375	5.125– 5.375
47 w.w.	5.25 – 5.50	5.25 – 5.50
CENTRAL MIGHIGAN (Prices f.o.b. Cent. Mich. refinery group basis, for shipment within Michigan. Shipments, however, may originate at plants outside Central group.)		
47-49 w.w.	5.00 – 5.55	5.00 – 5.55
OKLAHOMA		
41-43 w.w.	4.125– 4.25	4.125– 4.25
42-44 w.w.	4.375– 4.50	4.375– 4.50
KANSAS (For Kansas destinations only).		
41-43 w.w.	4.375– 4.625	4.375– 4.625
42-44 w.w.	4.625– 4.875	4.625– 4.875
(c)N. TEX. (For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments).		
41-43 w.w.	4.50	4.50
(c)E. TEX.		
41-43 w.w.	(a) 4.00 –4.125	(a)4.125
N. LA. (For shipment within La. and into Ark.)		
41-43 w.w.	4.375– 4.625	4.375– 4.625
ARK. (For shipment within Ark. and into La.).		
41-43 w.w.	(b)4.625	(b)4.625
CALIFORNIA		
40-43 w.w.	5.50 – 7.00	5.50 – 7.00

Gas *and* Fuel Oils

Prices Effective	April 4	Mar. 28
WESTERN PENNA.		
Bradford-Warren:		
36-40	4.375– 4.75	4.50 – 4.75
Other districts: (Excluding Pittsburgh District Prices).		
36-40	4.00 – 4.25	4.25 – 4.375
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis, for shipment within Michigan. Shipments, however, may originate at plants outside Central group.)		
P.W. Distillate	4.875– 5.25	4.875– 5.25
No. 3 gas oil, Str.	4.50 – 4.75	4.50 – 4.75
U.G.I. gas oil	3.75 – 4.375	4.25 – 4.50
Fuel Oils (Vis. at 100):		
500-700 Vis.	2.125– 2.625	2.125– 2.625
300-500 Vis.	2.25 – 2.75	2.25 – 2.75
100-300 Vis.	2.75 – 3.25	2.75 – 3.25
OKLAHOMA		
No. 1 white	3.75 – 4.00	3.75 – 4.00
No. 1 straw	(a) 3.75 –3.875	(a)3.75 –3.875
No. 2 straw	3.625– 3.75	3.625– 3.75
U. G. I. gas oil	(a) 3.00 –3.25	(a) 3.00 –3.25
28-30 zero	3.375– 3.50	3.375– 3.50
24-26	(b)$0.925	(b)$0.925
18-22	(a)$0.825-$0.875	(a)$0.825-$0.875
14-16	(a)$0.80-$0.825	(a)$0.80 -$0.825
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.125– 4.375	4.125– 4.375
10-14 fuel oil	$0.55 –$0.65	$0.55 –$0.65
N. TEX. (For shipment to Texas and N. Mex.; Group 3 prices quoted on northern shipments).		
No. 1 white	(a)4.25	(a)4.25
U. G. I. gas oil	2.75 – 2.875	2.75 – 2.875
N. LA. (For shipment within La. and into Ark.)		
No. 2	3.50 – 3.625	3.50 – 3.625
20-24	$1.10 –$1.15	$1.10 –$1.15
16-20	$0.90 –$0.95	$0.90 –$0.95
10-14	$0.80 –$0.85	$0.80 –$0.85
ARK. (For shipment within Ark. and into La.).		
No. 2	(b)3.75	(b)3.75
28-30 gas oil, zero	(b)3.50	(b)3.50
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.60 –$0.85	$0.60 –$0.85
Light fuel	$0.75 –$0.95	$0.75 –$0.95
Diesel fuel (per gal.)	3.50 – 4.00	3.50 – 5.00
Stove dist. (per gal.)	3.75 – 6.00	3.75 – 7.00
Los Angeles:		
Heavy fuel	$0.60 –$1.00	$0.60 –$1.00
Light fuel	$0.77 –$1.10	$0.77 –$1.10
Diesel fuel (per gal.)	3.00 – 4.00	3.00 – 5.00
Stove dist. (per gal.)	3.25 – 6.00	3.25 – 7.00

Gas and Fuel Oils (Cont'd)

Prices Effective	April 4	Mar. 28
San Francisco:		
Heavy fuel	$1.05	$1.05
Light fuel	$1.15	$1.15
Diesel fuel (per gal.)	4.50	5.50
Stove dist. (per gal.)	6.50	7.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give the following as their quotations only.)

Viscous Neutrals No. 3 col. (Viscosity at 70° F.)

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	20.50 –21.00	20.50 –21.00
10 p.t.	19.50 –20.00	19.50 –20.00
15 p.t.	19.00 –19.50	19.00 –19.50
25 p.t.	17.00 –17.50	17.00 –17.50
180 Vis. (165 at 100) 410-415 fl.		
25 p.t.	16.00 –16.50	16.00 –16.50
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	17.50 –18.00	17.50 –18.00
10 p.t.	16.50 –17.00	16.50 –17.00
15 p.t.	16.00 –16.50	16.00 –16.50
25 p.t.	15.00 –15.50	15.00 –15.50

SOUTH TEXAS

Vis. Color		
Pale Oils: (*Vis. at 100° F.*)		
100 No. 1½-2½	4.75 – 5.25	4.75 – 5.50
200 No. 2-3	6.25 – 6.75	6.25 – 7.00
300 No. 2-3	6.75 – 7.25	6.75 – 7.50
500 No. 2½-3½	7.75 – 8.25	7.75 – 8.50
750 No. 3-4	8.25 – 8.75	8.25 – 9.00
1200 No. 3-4	8.75 – 9.25	8.75 – 9.50
2000 No. 4	9.00 – 9.25	9.00 – 9.75
Red Oils:		
200 No. 5-6	6.25 – 6.75	6.25 – 7.00
300 No. 5-6	6.75 – 7.25	6.75 – 7.50
500 No. 5-6	7.75 – 8.25	7.75 – 8.50
750 No. 5-6	8.25 – 8.75	8.25 – 9.00
1200 No. 5-6	8.75 – 9.25	8.75 – 9.50
2000 No. 5-6	9.00 – 9.25	9.00 – 9.75

Note: South Texas red oil prices shown above cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

Pale Oils: (0 to 10 P.P.) Vis. Color		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	10.00	10.00
200—No. 3	10.50	10.50
250—No. 3	11.50	11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	9.00	9.00
200—No. 5	9.50	9.50
250—No. 5	10.50	10.50
280—No. 5	11.50 –11.75	11.50
300—No. 5	11.75	11.75

Note: Viscous oils, 15-25 p.p., generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils (c)0 to 10 p.p.: Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200—No. 3	11.50	11.50
250—No. 3	12.50	12.50
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

(c) Viscous oils, 15 to 30 p.p. are quoted 0.5c lower, 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., are quoted 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis).

Bright Stocks:		
190-200 Vis. at 210° D	19.00	19.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	16.00	16.00
10 to 25 p.p.	15.00 –15.50	15.00 –15.50
25 to 40 p.p.	15.00	15.00
150-160 vis. at 210° E.	15.00	15.00

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MARATHON PRODUCTS BEST IN THE LONG RUN

LINCO

THE OHIO OIL COMPANY

GENERAL OFFICES - - - FINDLAY, OHIO

ROBINSON, ILLINOIS TULSA, OKLAHOMA FT. WORTH, TEXAS

gasoline showed sustained improvement, according to the reports of refiners and resale agents. Sales were reported at 6.25 cents, up 0.125 cent on the low end of the market, and some sellers said they were asking a minimum of 6.5 cents.

Spring demand for kerosine has been slow in getting under way, refiners said, and prices, particularly in the upper field, were easier.

Fuel oil also was reported slow with sales and quotations 0.125 cent lower in the upper field and 0.25 cent lower in the lower field.

Demand for lubricating oils was negligible, according to reports. Movement continued entirely against contracts, refiners said, and they reported no changes in their quotations.

Coastal

N. P. N. News Bureau

NEW YORK, April 4. — The Gulf market was unsettled the week ended April 2, with varied reports concerning gas oil from traders, and with Roumania reported to have taken some of the play from American gasoline in foreign markets.

Following the expropriation of the Mexican oil industry, foreign buyers became more active in the American Gulf market. Most of the interest centered on export grades of gasoline. Before the Gulf market had an opportunity to take advantage of foreign inquiries, reports here were that Roumanian gasoline stepped in and virtually stole the show.

Reports concerning the amount of gasoline available from Roumanian sellers varied. At least one cargo was said to have been sold at a price which was equivalent to 4.5 cents, f.o.b. the American Gulf. As the week progressed, Roumania became less of a factor, but on the other hand, virtually all buying activity at the Gulf had ceased.

One large buyer reported a firm offer of low diesel index gas oil at 3.5 cents. Another trader said he was unable to pick up three cargoes of gas oil for which he had orders.

A cargo of approximately 60,000 barrels of 55 diesel index gas oil for late April and early May lifting was reported sold early last week at 3.875 cents, f.o.b. the Gulf.

California

N. P. N. News Bureau

LOS ANGELES, April 2. — Prices posted by major and large independent suppliers for tank car and truck and trailer lots of burning oils were cut 1 cent a gallon March 30 at all Pacific Coast refinery and terminal points. The same suppliers also reduced posted prices on small deliveries of diesel oil to marine vessels 0.5 cent a gallon at coastal points.

The general move was reported made to meet competition offered by

(*Continued on page* 60)

Fuel Oil . . . . .

CHICAGO, April 4.—Small-lot shipments characterized the light fuel market at Chicago last week. Offerings were freer and inquiry continued spotty, sellers reported. Better grades of light fuels suffered only slight price recessions although unsubstantiated reports of deeper price cuts were occasionally heard.

Michigan refiners also reported further easing in demand for prime white distillate. Current distillate demand is chiefly for tractor fuel purposes, they said. Prices were down 0.125 cent to 4.875-5.25 cents.

Heavy fuels continued stagnant in the Chicago area as industrial activity remained in the doldrums.

Michigan refiners generally reported sales volume of heavy fuels on par with current production. However, stocks continued to be burdensome, they said.

* * *

NEW YORK, April 4.—Fuel oil markets along the eastern seaboard were featureless as end of the 1937-1938 heating oil season neared.

Heavy industrial fuel oil at New York harbor was easy. Price of 75 cents a barrel for this oil at the Gulf, with the current boat rate of around 16 cents a barrel, would bring this material to the New York harbor at between 90 and 95 cents a barrel, shipside. While most companies were still posting $1.15 a barrel at New York, reports were that quotations for this grade had ranged down to $1.00 a barrel. General prices, however, were reported between $1.05 and $1.15 by all sellers.

Domestic heating oil, while relatively steady in price in most markets, enjoyed only fair movement.

* * *

TULSA, April 4.—Inactivity was the keyword in the Mid-Continent fuel oil market the past week. Both light and heavy grades were suffering from lack of demand.

Cold flurry in the north was responsible for occasional orders, but most distributors were not interested in buying heating oil at present. Few changes were reported in light fuel prices, since most refiners have discontinued making these oils. Some excess offerings at price concessions were reported, but not confirmed.

Heavy fuels were sluggish. Two chief outlets for these oils—the railroads and industrial concerns—were slow in furnishing shipping instructions, refiners said.

Joins Hartol Products

NEW YORK, April 4. — Tom Phelps has joined the sales organization of the Hartol Products Corp. He will cover the Merrimac Valley territory, with headquarters in Lowell, Mass.

Logan Wood Dies

DETROIT, April 2.—Logan Thomas Wood, vice-president and general manager of Gar Wood Industries, Inc., and brother of Gar Wood, president of the company, died March 28 in a hospital at San Francisco, where he had been taken when stricken with pneumonia during a business trip on the west coast.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect April 4, 1938

Following are tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 3	No. 4
S. O. NEW JERSEY				
Atlantic City, N. J.	8.5	6.5	....	6.5
Newark	8.5	6.5	....	6.5
Annapolis, Md.	....	7.25	....	....
Baltimore	8.0	7.0	....	7.0
Washington, D. C.	8.5	7.75	....	7.75
Norfolk, Va.	8.0	6.75	....	....
Petersburg	8.25	7.0	....	....
Richmond	8.25	7.0	....	7.0
Charlotte, N. C.	9.5	8.5	....	....
Hickory	....	9.0	....	....
Raleigh	9.5	8.0	....	....
Charleston, S. C.	8.625	7.375	....	....
Columbia	9.8	8.5	....	....
Spartanburg	10.6	9.3	....	....

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING Cont'd				
Philadelphia, Pa.	7.75	7.00	7.00	7.00
Allentown, Pa.	8.25	7.50	7.50	7.50
Wilmington, Del.	8.25	7.50	7.50	7.50
Springfield, Mass.	9.00	7.50	....	7.50
Worcester, Mass.	9.00	7.50	....	7.50
Hartford, Conn.	9.00	7.50	....	7.50
S. O. OHIO				
Columbus Division and Cleveland	7.50	7.50	7.00	....
City of Lima	8.00	8.00	7.00	....
Rest of Ohio	8.00	8.00	7.50	....

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

SOCONY-VACUUM OIL CO. INC.

(S. O. New York Division)

New York City	*	7.50	7.50	7.50
Albany, N. Y.	*	7.50	7.50	7.50
Rochester, N. Y.	*	7.50	7.50	7.50
Boston, Mass.	*	7.00	7.00	7.00
Bangor, Me.	*	8.00	8.00	8.00
Manchester, N. H.	*	7.50	7.50	7.50
Burlington, Vt.	*	8.00	8.00	8.00
Hartford, Conn.	*	7.00	7.00	7.00
New Haven, Conn.	*	7.00	7.00	7.00
Providence, R. I.	*	7.00	7.00	7.00

*Prices for No. 1 fuel in Socony-Vacuum territories same as for kerosine which see in tank wagon table for various cities: prices change with kerosine.

S. O. INDIANA

Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	†8.8	7.00
Indianapolis	...	*12.2
Detroit	...	7.1
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
Sioux City	7.5	7.5
St. Louis	7.7	7.0
Kansas City	6.8	6.8

*Includes state tax of 4c.

†This price applies to 1 to 99 gals. deliveries; 150 gals. and over, 7c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Cylinder Stocks (cont'd)

Prices Effective	April 4	Mar. 28
Mid-Continent (cont'd)		
120 Vis. at 210° D:		
0 to 10 p.p.	15.125–15.25	15.125–15.25
10 to 25 p.p.	14.50	14.50
25 to 40 p.p.	14.25	14.25
600 S.R. Dark Green	5.00 – 7.50	5.00 – 7.50
600 S.R. Olive Green	7.00 – 9.50	7.00 – 9.50
631 S.R.	(b)12.50	(b)12.50
Black Oil	3.50 – 4.00	3.50 – 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	17.75	17.75
15 to 25 p.p.	16.75	16.75
30 to 40 p.p.	16.25	16.25
E filtered Cyl. Stock	14.50	14.50

To obtain prices delivered in Chicago, add 0.25c per gal.
(a) Nominal.
(b) Only one refiner quoting.

Prices Effective	April 4	Mar. 28
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give the following as their quotations only.)		
600 S.R. filterable	8.50 – 9.50	8.50 – 9.50
650 S.R.	10.50 –11.50	10.50 –11.50
600 fl.	11.00 –12.00	11.00 –12.00
630 fl.	14.00 –15.00	14.00 –15.00
600 Warren E.	Prices Disctd.	13.00 –13.50
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	18.50 –19.00	18.50 –19.00
15 p.t.	17.50 –18.00	17.50 –18.00
20 p.t.	16.50 –17.00	16.50 –17.00
25 p.t.	15.50 –16.00	15.50 –16.00

Petrolatums

WESTERN PENNA. (In bbls., carloads; in tank cars, 0.5c less)		
Snow White	6.125– 6.25	6.125– 6.25
Lily White	5.125– 5.25	5.125– 5.25
Cream White	4.125– 4.25	4.125– 4.25
Light Amber	2.625– 2.75	2.625– 2.75
Amber	2.375– 2.50	2.375– 2.50
Red	2.00 – 2.25	2.00 – 2.25

Wax

Prices Effective	April 4	Mar. 28
WESTERN PENNA. (In bbls., carloads, New York)		
122-124 A.m.p., w.c. scale	1.90 – 2.00	1.90 – 2.00
124-126 A.m.p., w.c. scale	1.90 – 2.00	1.90 – 2.00
OKLAHOMA (In bbls. or burlap bags, carloads)		
124-126 A.m.p., w.c. scale	(b) 2.10 –2.25	(b) 2.10 –2.25

(b) Only one refiner quoting.

CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)

Fully refined:		
122-124	4.45	4.45
125-127	4.55	4.55
127-129	4.65	4.65
130-132	**5.10	**5.10
132-134	**5.35	**5.35
135-137	**6.10	**6.10

**Same prices quoted in bags or slabs loose.

MID-WESTERN TANK CAR MARKET

Prices are those made by Chicago sellers, on Group 3 (Oklahoma) freight basis, although shipments may originate in other South-western or Mid-western refining districts

Gasoline

Prices Effective	April 4	Mar. 28
U. S. Motor: (Octane Test L-3)		
62 oct. and below	4.25 – 4.375	4.25 – 4.375
63-66 oct.	4.375– 4.625	4.375– 4.625
67-69 oct.	4.75 – 5.00	4.75 – 4.875
70-72 oct.	5.00 – 5.25	4.875– 5.25

Kerosine

41-43 w.w.	4.125– 4.25	4.125– 4.25
42-44 w.w.	4.25 – 4.50	4.25 – 4.50

(b) One seller quoting.

Fuel and Gas Oils

Prices Effective	April 4	Mar. 28
Domestic:		
No. 1 p.w.	3.875– 4.00	3.875– 4.125
No. 1 straw	3.75 – 3.875	3.75 – 4.00
No. 2 straw	3.50 – 3.75	3.625– 3.875
No. 2 dark	Prices Disctd.	3.50 – 3.75
No. 3	3.375– 3.50	3.375– 3.625
No. 4	$1.05 –$1.10	$1.05 –$1.10
No. 5	$0.65 –$0.75	$0.70 –$0.80
Range oil	3.875– 4.125	3.875– 4.125
Industrial:		
No. 4	$0.95 –$1.05	$0.95 –$1.10
No. 5	$0.60 –$0.65	$0.65 –$0.75

Prices Effective	April 4	Mar. 28
Industrial (cont'd)		
No. 6	$0.45 –$0.55	$0.475–$0.60
U. G. I. gas oil	2.625– 2.875	2.625– 3.00

Naphtha and Solvent

Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	7.375	7.375

DAILY GASOLINE PRICES

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended April 1, 1938)

U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):	March 28	March 29	March 30	March 31	April 1
62 octane and below:					
Oklahoma	4.375– 4.50	4.375– 4.50	4.375– 4.50	4.375– 4.50	4.375– 4.50
*North Texas	†4.50 – 4.75	†4.50 – 4.75	†4.50 – 4.75	†4.50 – 4.75	†4.50 – 4.75
West Texas	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
Mid-Western (Group 3 basis)	4.25 – 4.375	4.25 – 4.375	4.25 – 4.375	4.25 – 4.375	4.25 – 4.375
63-66 octane:					
Oklahoma	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75
*North Texas	†5.00 – 5.50	†5.00 – 5.50	†5.00 – 5.50	†5.00 – 5.50	†5.00 – 5.50
West Texas	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
Mid-Western (Group 3 basis)	4.375– 4.625	4.375– 4.625	4.375– 4.625	4.375– 4.625	4.375– 4.625
67-69 octane:					
Oklahoma	4.875– 5.00	4.875– 5.00	4.875– 5.00	4.875– 5.00	4.875– 5.00
*North Texas	†5.375– 5.625	†5.375– 5.625	†5.375– 5.625	†5.375– 5.625	†5.375– 5.625
West Texas	5.625– 5.875	5.625– 5.875	5.625– 5.875	5.625– 5.875	5.625– 5.875
Mid-Western (Group 3 basis)	4.75 – 4.875	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	5.00 – 5.25
70-72 octane:					
Oklahoma	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
*North Texas	†5.625	†5.625	†5.625	†5.625	†5.625
West Texas	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
Mid-Western (Group 3 basis)	4.875– 5.25	4.875– 5.25	4.875– 5.25	4.875– 5.25	4.875– 5.25
Motor Gasoline, 60-64 oct.					
New York harbor	†6.25 – 6.50	†6.25 – 6.50	†6.25 – 6.50	†6.25 – 6.50	†6.25 – 6.50
Philadelphia district	†6.75	†6.75	†6.75	†6.75	†6.75
Baltimore district	†6.75	†6.75	†6.75	†6.75	†6.75
Motor Gasoline, 65 oct. & above:					
New York harbor	†6.50 – 6.75	†6.50 – 6.75	†6.50 – 6.75	†6.50 – 6.75	†6.50 – 6.75
Philadelphia district	†6.75	†6.75	†6.75	†6.75	†6.75
Baltimore district	†6.75 – 7.00	†6.75 – 7.00	†6.75 – 7.00	†6.75 – 7.00	†6.75 – 7.00
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	5.125	5.125	5.125	5.125	5.125
Other districts (Western Penna.)	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	4.75 – 5.00
Motor Gasoline, Min , 65 oct.:					
Bradford-Warren (Western Penna.)	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
Other districts (Western Penna.)	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50

*For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipment.
†Nominal.
‡Only one refiner quoting.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect April 4, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Essolene (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Atlantic City, N. J.	7.25	8.75	4	8.5
Newark, N. J.	7.25	8.75	4	8.5
Annapolis, Md.	8.35	9.85	5	9.5
Baltimore, Md.	7.75	9.25	5	9
Cumberland, Md.	9.15	11.65	5	10
Washington, D. C.	8	9.5	3	9.5
Danville, Va.	8.45	10.95	6	12.9
Norfolk, Va.	7.25	9.75	6	11.5
Petersburg, Va.	7.55	10.05	6	11.7
Richmond, Va.	7.55	10.05	6	11.7
Roanoke, Va.	8.75	11.25	6	12.9
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	9.35	6	11.2
Wheeling, W. Va.	8.85	10.25	6	12.2
Charlotte, N. C.	9.15	11.65	7	12.6
Hickory, N. C.	9.65	12.15	7	13
Mt. Airy, N. C.	9.45	11.95	7	12.8
Raleigh, N. C.	8.75	11.25	7	12.1
Salisbury, N. C.	9.25	11.75	7	12.7
Charleston, S. C.	7.75	10.25	7	11.1
Columbia, S. C.	8.75	11.25	7	12.1
Spartanburg, S. C.	9.45	11.95	7	12.9

Discount to undivided dealers: Dealer t.w. price less 0.5c per gal.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(*S. O. New York Division*)

Socony Mobilgas (*Regular Grade*)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.5	9.5	*5	8.75
Borough of Richmond (Staten Is.)	7.5	9.5	*5	8.75
Albany, N. Y.	7.5	9.5	5	9
Binghamton, N. Y.	8.7	10.3	5	9
Buffalo, N. Y.	8.5	9	5	7.5
Jamestown, N. Y.	7.8	10.3	5	8.25
Plattsburg, N. Y.	7.5	9.9	5	9.5
Rochester, N. Y.	8.2	10	5	8.5
Syracuse, N. Y.	8.1	9.5	5	9
Danbury, Conn.	7.8	9.8	4	9
Hartford, Conn.	7.6	9.6	4	8.5
New Haven, Conn.	7.5	9.5	4	8
Bangor, Me.	8.7	10.3	5	9.5
Portland, Me.	8.2	10	5	8.75
Boston, Mass.	8	9.5	4	8.5
Concord, N. H.	8.7	11	5	9.5
Lancaster, N. H.	9.6	12	5	10.25
Manchester, N. H.	8.5	10.5	5	9
Providence, R. I.	8	9.8	4	8.5
Burlington, Vt.	8.4	10.4	5	9.5
Rutland, Vt.	8.7	10.7	5	9

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial Tank Car	Dealer T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7.25	8.75	12	5	10.5
Pittsburgh	8	10	15	5	11
Allentown	7.75	9.25	**	5	11
Erie	8	9.5	**	5	10
Scranton	8	9.5	**	5	11
Altoona	8	10	**	5	11
Harrisburg	7.5	9	**	5	11
Williamsport	8	10	**	5	11
Dover, Del.	...	9	**	5	11
Wilmington	...	9	**	5	11
Boston, Mass.	...	9	**	4	8.5
Springfield, Mass.	...	9.5	**	4	8.5
Worcester, Mass.	...	10.3	**	4	9
Fall River, Mass.	...	8.5	**	4	8.5
Hartford, Conn.	...	9.6	**	4	8
New Haven, Conn.	...	9.5	**	4	8
Providence, R. I.	...	9.3	**	4	8.5
Atlantic City, N. J.	...	8.75	**	4	8.5
Camden, N. J.	...	8.75	**	4	8.5
Trenton, N. J.	...	8.75	**	4	8.5
Annapolis, Md.	...	9.85	**	5	9.5
Baltimore, Md.	...	9.25	**	5	9
Hagerstown, Md.	...	10.35	**	5	10
Richmond, Va.	...	10.05	**	6	11.7
Wilmington, N. C.	...	10.35	**	7	11.3
Brunswick, Ga.	...	10	**	7	*13
Jacksonville, Fla.	...	9.5	**	8	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

**Atlantic Refining transferred stations to dealers; no prices available.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal.

Price basis to commercial consumers: in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases to contract accounts taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w. delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

Sohio X-70 Gasoline (*Regular Grade*)

	Consumer T.W.	†Divided Dlr.	Gasoline Taxes	Kerosine T.W.
Ohio State-wide	11.5	10.5	5	*12
Counties where prices are below statewide:				
Columbiana, Defiance and Pickaway	11	10	5	....
Franklin, Knox and Paulding	10.5	9.5	5	....

Renown Gasoline (*Third Grade*)

Ohio State-wide	11	10	5	....
Counties where prices are below statewide:				
Columbiana, Defiance and Pickaway	10.5	9.5	5	....
Franklin, Knox and Paulding	10	9	5	....
Counties where prices are above statewide:				
Butler, Clermont, Darke, Greene, Hamilton, Miami, Montgomery, Preble and Warren	11.5	10.5	5	....

S. O. Ohio Cont'd

Kerosine Prices

(*Off Statewide Level*)

Kerosine prices are off statewide level in the following counties:

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull, Union, Van Wert and Wyandot: *11.5
Paulding *11
Ashtabula *10.5
Fayette, Licking, Madison, Pickaway, Portage and Summit *8.5

†This price also to authorized agents, exclusive of 0.5c rental. Discount to undivided dealers: 0.5c less than divided dealer t.w.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

Commercial Tank Wagon Q.D.A. to contract accounts: Effective Oct. 20, 1937, thru Ohio (except in 31 counties), on monthly purchases, off posted consumer t.w. price: 0 to 999 gals., 0.5c; 1,000 to 19,999 gals., 1.5c; 20,000 gals. and over, 2.5c. The 31 counties where Q.D.A. differs from statewide are: Allen, Ashtabula, Auglaize, Butler, Champaign, Cuyahoga, Darke, Defiance, Erie, Fulton, Geauga, Hamilton, Hardin, Henry, Logan, Lorain, Lucas, Mahoning, Mercer, Ottawa, Paulding, Putnam, Sandusky, Scioto, Shelby, Trumbull, Union, Van Wert, Washington, Williams and Wood.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices," S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on statewide level.

S. O. Kentucky

Crown Gasoline (*Regular Grade*)

	Consumer T.W.	Net Dlr.	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	12.5	10.5	6	11
Lexington, Ky.	13.5	10.5	6	11
Louisville, Ky.	13	10	6	10.5
Paducah, Ky.	11	8	6	10
Jackson, Miss.	12.5	9.5	7	*12
Vicksburg, Miss.	12.5	9.5	7	*12
Birmingham, Ala.	13	10	*8	12
Mobile, Ala.	12	9	*9	11
Montgomery, Ala.	13	10	*9	*12
Atlanta, Ga.	14	11	7	*13
Augusta, Ga.	14	11	7	*13
Macon, Ga.	14	11	7	*13.5
Savannah, Ga.	12.5	9.5	7	*11
Jacksonville, Fla.	12.5	9.5	8	11
Miami, Fla.	12.5	9.5	8	12.5
Pensacola, Fla.	13	10	*9	12
Tampa, Fla.	12.5	9.5	8	10.5

Kyso Gasoline (*Third Grade*)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	11.5	9	6	....
Louisville, Ky.	11	8.5	6	....
Paducah, Ky.	9	6.5	6	....
Jackson, Miss.	11	8.5	7	....
Vicksburg, Miss.	11	8.5	7	....
Birmingham, Ala.	11	8.5	*8	....
Mobile, Ala.	9.5	7	*9	....
Montgomery, Ala.	10.5	8	*9	....
Atlanta, Ga.	12	9.5	7	....
Augusta, Ga.	12	9.5	7	....
Macon, Ga.	12	9.5	7	....
Savannah, Ga.	10.5	8	7	....
Pensacola, Fla.	11	8.5	*9	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month.

Discounts on kerosine: Prices in Kentucky are net, but in other states subject to 2c discount.

**Taxes*: In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia, Mississippi and Montgomery, Ala. have kerosine taxes of 1c per gal., not included in above prices.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel. 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fee only: Iowa, 3/50c; Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes**; *they do, however, include inspection fees as shown in general footnote. Gasoline taxes shown in separate column, include* 1c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect April* 4, 1938, *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Dealer Prices				
	Red Crown Cons. T.W.	Red Crown T.W.	Stano-lind T.W.	Gaso-line Taxes	Kero-sine T.W.
Chicago, Ill.	11.6	9.6	8.4	4	10.5
Decatur, Ill.	11.6	10.1	12	4	10.5
Joliet, Ill.	11.6	10.1	8.4	4	10.5
Peoria, Ill.	11.6	10.1	9.6	4	10.5
Quincy, Ill.	11.4	9.9	8.8	4	10.3
Indianapolis, Ind.	12.3	10.8	9.6	5	*11.2
Evansville, Ind.	12.1	10.6	7.1	5	*11
South Bend, Ind.	12.6	11.1	9.6	5	*9.4
Detroit, Mich.	11.3	9.8	9.3	4	10
Grand Rapids, Mich.	12.5	9.3	9.3	4	11.2
Saginaw, Mich.	12.3	10.8	10.3	4	9.3
Green Bay, Wis.	12.4	10.9	10.2	5	10.3
Milwaukee, Wis.	11.8	10.3	9.5	5	10.7
La Crosse, Wis.	12	10.5	10	5	10.9
Minneapolis-St. Paul	12	10.5	10	5	10.9
Duluth, Minn.	12.4	10.9	10.4	5	11.3
Mankato, Minn.	12	10.5	10	5	10.9
Des Moines, Ia.	11.4	9.9	7.5	4	*8.3
Sioux City, Ia.	11.6	10.1	9.6	4	*10.5
Davenport, Ia.	11.6	10.1	9.6	4	*10.5
Mason City, Ia.	11.8	10.3	9.8	4	*10.7
St. Louis, Mo.	11.2	9.7	7.5	*4	10.1
Kansas City, Mo.	10.9	9.4	8.9	*4	9.8
St. Joseph, Mo.	10.9	9.4	8.9	*4	9.8
Fargo, N. D.	13.2	11.7	11.2	4	12.1
Minot, N. D.	14.5	13	12.5	4	13.4
Huron, S. D.	12.5	11	10.5	5	11.4
Wichita, Kans.	10.4	8.9	7.9	4	8.3

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Indiana has 4c, and Iowa has 3c kerosine tax per gal., not included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W.	Dealer	Gaso-line Taxes	Kero-sine T.W.
Omaha, Neb.	12	10.5	6	10.8
McCook	11.8	9.3	6	10.3
Norfolk	12.4	10.9	6	10.3
North Platte	12.8	9.2	6	11.2
Scottsbluff	13.5	10.3	6	12.3

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Little Rock, Ark.	7.25	9.75	7.5	11.5
Alexandria, La.	7	9.5	8	*9.5
Baton Rouge, La.	6.5	9	8	*11
New Orleans, La.	6.5	9	*10	*10
Lake Charles, La.	7.5	10	8	*11.5
Shreveport, La.	6	8.5	8	*8.5
Lafayette, La.	7.5	10	8	*11.5
Bristol, Tenn.	9.75	11	8	14.5
Chattanooga, Tenn.	9	11.5	8	13.5
Knoxville, Tenn.	9.5	12	8	14
Memphis, Tenn.	7.5	10	8	12
Nashville, Tenn.	8.5	11	8	10.5

*New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, not included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

Humble Motor Fuel
(*Regular Grade*)

	*T.W.	S.S.	Gaso-line Taxes	Kero-sine T.W.
Dallas, Tex.	9	13	5	8
Ft. Worth, Tex.	9	13	5	8
Houston, Tex.	9.5	13.5	5	8
San Antonio, Tex.	8.5	12.5	5	8

U. S. Motor Gasoline
(*Third Grade*)

Dallas, Tex.	7	10	5
Ft. Worth, Tex.	7.5	10	5
Houston, Tex.	8.5	11.5	5
San Antonio, Tex.	7.5	10.5	5

*Price is t.w. price to all classes of dealers and consumers.

Price basis to "open" dealers: discount off posted retail price: when posted retail price, including all taxes on Esso motor fuel is: 19.1c per gal. and above, discount is 3.5c; 19c to 18.1c, 3c, and 18c and below, 2.5c. Humble motor fuel, 17.1c and above, 3.5c; 17 to 16.1c, 3c; and 16c and below, 2.5c; U. S. motor fuel, 15.1c and above, 2.5c; 15 to 14.1c, 2c; and 14c and below, 1.5c.

Continental Oil

Conoco Bronze (*Regular Grade*)
Demand (*Third Grade*)

	—Dealer Prices— Conoco Bronze	Demand	Gaso-line Taxes	Kero-sine T.W.
Denver, Colo.	9	8	5	11.5
Grand Junc., Colo.	14	13	5	15
Pueblo, Colo.	8	7	5	10.5
Casper, Wyo.	12	11	5	11.5
Cheyenne, Wyo.	11	7	5	13
Billings, Mont.	13.5	12	6	15.5
Butte, Mont.	13.5	10.5	6	15.5
Great Falls, Mont.	13.5	12.5	6	15.5
Helena, Mont.	13.5	12.5	6	15.5
Salt Lake City, Utah	14.5	11.5	5	16
Boise, Ida.	15.5	13.5	6	18
Twin Falls, Ida.	15	14	6	18
Albuquerque, N. M.	11	10	†6.5	12
Roswell, N. M.	11	8.5	†6.5	10.5
Santa Fe, N. M.	12	9.5	*7	12
Muskogee, Okla.	9.5	8	5	7
Oklahoma City, Okla.	9	6	5	8
Tulsa, Okla.	9	6	5	6
Ft. Smith, Ark.	9.25	8.5	5	8
Little Rock, Ark.	9.75	7.625	7.5	9.5
Texarkana, Ark.	9	6	5	8.5

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

Standard Gasoline
(*Regular Grade*)

	T.W.	S.S.	Gaso-line Taxes	Kero-sine T.W.
San Francisco, Cal.	13.5	14.5	4	11.5
Los Angeles, Cal.	13	14	4	10
Fresno, Cal.	14.5	15.5	4	12.5
Phoenix, Ariz.	15	16	6	*12
Reno, Nev.	15	16	5	13
Portland, Ore.	14	15	6	13.5
Seattle, Wash.	14	15	6	13.5
Spokane, Wash.	16.5	17.5	6	16
Tacoma, Wash.	14	15	6	13.5

Flight Gasoline
(*Third Grade*)

San Francisco, Cal.	12	13	4	....
Los Angeles, Cal.	11.5	12.5	4	....
Fresno, Cal.	13	14	4	....
Reno, Nev.	13.5	14.5	5	....
Phoenix, Ariz.	13.5	14.5	6	....
Portland, Ore.	12.5	13.5	6	....
Seattle, Wash.	12.5	13.5	6	....
Spokane, Wash.	15	16	6	....
Tacoma, Wash.	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal., not included in above prices.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price: on single deliveries of 40 gallons and over. Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price. Discounts on kerosine: in tank cars, 3c off tank truck price; plant deliveries to jobbers, 2.5c below tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline
(*Regular Grade*)

	T.W.	Gasoline Taxes	Kero-sine T.W.
Hamilton, Ont.	16	6	17
Toronto, Ont.	16	6	17
Brandon, Man.	21.1	7	22.3
Winnipeg, Man.	20.5	7	20.7
Regina, Sask.	20	7	22
Saskatoon, Sask.	22.8	7	24.8
Edmonton, Alta.	19.5	7	21.5
Calgary, Alta.	17	7	19
Vancouver, B. C.	16	7	23
Montreal, Que.	15	6	17.5
St. John, N. B.	14.5	10	18.5
Halifax, N. S.	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car and/or tank wagon prices, as indicated, of aviation gasoline in principal marketing territories (Stanavo Aviation Gasoline in all territories except where otherwise noted).

S. O. NEW JERSEY

	*Ethyl T.C.	Tank Car	T.W.
Bayonne, N. J.	19.5	9.5	12.5
Baltimore, Md.	....	10	13
Washington, D. C.	....	....	13.5
Richmond, Va.	....	....	14.7
Greensboro, N. C.	....	....	15.7
Raleigh, N. C.	....	....	17.6
Charleston, W. Va.	....	....	12.2

*This is Stanavo Ethyl Aviation Gasoline, 100 octane number, tank car price.

COLONIAL BEACON OIL CO.

	T.W.
Brooklyn, N. Y.	12.8
Buffalo, N. Y.	14.5
Boston, Mass.	15

S. O. PENNSYLVANIA

Philadelphia, Pa.	13.6
Pittsburgh, Pa.	14.4

S. O. LOUISIANA

New Orleans, La.	13.3
Shreveport, La.	13.6

Prices in above four territories are on a 74 octane grade aviation gasoline except where otherwise noted. An 80 octane product generally brings 0.5c premium and an 87 octane product, 1.5c premium over the 74 octane grade.

Note: S.a. prices in above four territories are generally 6c over t.w. prices. Above t.w. prices are net, with no discounts allowed for quantity purchases. T.w. prices are generally tank car price, plus freight, plus 2.5c per gal.

S. O. OHIO
Thru Ohio
Stanavo Ethyl Aviation

	Consumer T.W.	Gasoline Taxes
73 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Ethyl Aviation Gasoline, 73 Octane Number

Chicago, Ill.	14.9	4
Detroit, Mich.	16.5	4
Milwaukee, Wis.	15.1	5
Minneapolis, Minn.	15.3	5
St. Louis, Mo.	14.5	3
Kansas City, Mo.	14.2	*4
Fargo, N. D.	16.5	4
Huron, S. D.	15.8	5

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.

	Tank Car
Baytown, Tex.	8.5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	Dealer	Gasoline Taxes
Denver, Colo.	14.5	5
Cheyenne, Wyo.	15	5
Helena, Mont.	16.5	6
Salt Lake City, Utah	17.5	5
Albuquerque, N. M.	14	*6.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz.	17	6
Los Angeles, Cal.	15	4
San Francisco, Cal.	15.5	4
Reno, Nev.	17	5
Portland, Ore.	16	6
Seattle, Wash.	16	6
Spokane, Wash.	18.5	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

TANK WAGON MARKETS

Tank car, ank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in genera footnote. Gasoline taxes, shown in separate column, include* 1c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect April* 4, 1938, *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

Posted Tank Wagon Prices

	Mineral Spirits	V.M.&P.
Newark, N. J.	11.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	13	14
New York City	9.5	11.5
Rochester, N. Y.	13	15
Syracuse, N. Y.	14	15
Boston, Mass.	13.5	14
Bridgeport, Conn.	12.5	14
Hartford, Conn.	12	13.5
Providence, R. I.	13.5	14.5

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13.5

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill.	16.2	16.5	15.9
Detroit, Mich.	19.7	18.7	19.8
Kansas City, Mo.	14.7	15.7	14.7
St. Louis, Mo.	15.0	16.0	15.9
Milwaukee, Wis.	19.6	20.6	19.6
Minneapolis, Minn.	19.8	20.8	17.7

Note: Prices for V. M. & P. apply also to Light Cleaners Naphtha. All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	10.5	9.5
New York Harbor	10	9
Philadelphia district	10.5	9
Boston	10.5	9.5
Providence	10.5	9.5
Ohio points, delivered	8.875	*8

*This is on rubber solvent.

Note: In Ohio, prices on D.C. naphtha and special Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P.

Latest Changes

From Mar. 29 to April 4 inclusive. Dates and amounts of changes shown. See table for full current prices.

Socony-Vacuum—Socony Mobilgas:

Consumer t. c. and dealer t. w. up 0.5c, thru New England with the exception of the state of Connecticut, Mar. 30.

S. O. Ohio—X-70 and Renown:

Up 0.5c, thru Ohio, including all areas where prices were below or above statewide level, April 3. S. S. prices were included in advance at points where stations are operated.

S. O. Indiana—Red Crown, Stanolind and Kerosine:

Exceptions to the 0.3c general advance to cover freight rate increase, Mar. 28, reported previously, were these points: up 0.2c, Detroit and Grand Rapids; up 0.4c, Duluth, Green Bay, Huron, Indianapolis, Mason City and South Bend; up 0.6c, Fargo and Minot.

S. O. Nebraska—Standard Red Crown and Kerosine:

Up 0.3c, thru territory, March 31.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

Socony-Vacuum Oil Co.—Socony Mobilgas:

In general 0.5c cut on consumer t. c. prices, Dec. 17, 1937, as reported on page 56 of Dec. 22 issue, the following points were cut irregular amounts, Socony-Vacuum has just announced: Buffalo, 0.54c, to 8c; Jamestown, 0.48c, to 7.8c; Rochester, 0.47c, to 8.2c; Syracuse, 0.52c, to 8.1c.

Also split dealer t. w. prices, Dec. 17, were cut 0.5c at Jamestown and Plattsburg, to 10.3c and 9.9c respectively, excluding all taxes.

Split dealer t. w. cut 0.5c, Buffalo, to 9c, March 11.

California

(*Continued from page* 56)

one large refiner signing up contracts at equivalent quotations. Following the cut, prices on diesel, burner, and 24 plus fuel oils were 4 cents a gallon at Los Angeles and San Joaquin Valley refinery points and 4.5 cents at San Francisco, with corresponding reductions at other points. Pipeline delivery of diesel oil to small marine vessels was 4.5 cents, Los Angeles and 5 cents San Francisco. Bunker prices were not affected and there was no reduction in heavy fuel oil quotations.

This weakness in fuel oil was declared to have strengthened the domestic gasoline market. Small refiners were reported finding it difficult to move good or bad fuel oil at any price and had to get more for their gasoline or shut down. Full storage threatened to close several plants.

At the end of the week several independent plants, which had been supplying most of the low-priced gasoline in the Los Angeles Basin, raised rack prices to 7.75 cents, exclusive of tax, and posted a retail price of 13.9 cents — the retail price on major and large independent third-grade is 16.5 cents.

Suppliers interested in the offshore trade were nonplussed by reports late in the week that an east coast refiner had been low bidder on gasoline and kerosine needs in the Panama Canal Zone. A delivered price of 6.125 cents on U. S. Motor gasoline and 5.99 cents on government specification kerosine, reported as winning bids on about 20,000 barrels of the former and about 5000 barrels of the latter, were pointed to as placing the refinery net-back at 5.125 cents and 4.75 cents on the two products, respectively.

Bids by Pacific Coast suppliers on this business were said to have been more than 0.5 cent a gallon higher.

Some exploratory inquiry, principally from Pacific foreign points, was reported in the local market testing out ideas of price on gasoline and gas oil. Quotations remained practically unchanged from the previous week.

Possibility that east coast refiners, formerly obtaining crude supplies from Mexico, would enter the Pacific Coast area for their requirements was seen by some observers the past week. Interests were understood to be feeling the pulse of the local crude situation.

Wax

NEW YORK, April 4. — Wax markets were without especial feature, either domestic or export, at the Gulf and New York, according to reports of traders the week ended April 2.

With a decline in wax production at the Gulf, according to reports here, sellers were holding their scale waxes for slightly higher prices, resisting foreign buyers' ideas of prices which they said were between 10 and 15 points lower than current prices at the Gulf.

Export movement of wax was at a fair rate, according to the reports of some traders who credit the fairly steady shipments to buying by foreign munitions makers.

Pennsylvania Refinery Lubricating Oil Inventory

(Issued by National Petroleum Association)

	March 17 Gallons	March 24 Gallons
1. **Raw Long Residuum** (Including all raw long residuum below, and not salable, as 600 fire)	1,198,590	953,685
2. **600 Steam Refined** (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	7,129,790	6,758,468
3. **Other Steam Refined** (Not included in 1 and 2 above)	5,849,025	6,072,495
4. **Finished Dewaxed Long Res.**	3,418,864	3,143,104
5. **Bright Stock** (Does not include any material reported in 4, above)	22,412,828	23,364,230
6. **Viscous Neutral,** below 180 vis. but not below 142 vis. @ 100	8,672,365	9,190,389
7. **Viscous Neutral,** 180 vis @ 100 and above	9,304,079	9,247,797

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M.D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	April 4	
District:	(a)60-64 Oct.	(a)65 Oct. & Above
N. Y. harbor	6.25 – 6.50	6.50 – 6.75
(b)N.Y.harbor	6.00 – 6.25	6.00 – 6.50
Philadelphia	6.50 – 6.75	6.50 – 6.75
Baltimore	6.50 – 6.75	6.50 – 7.00
Norfolk	7.00 – 7.25	7.25 – 7.50
Wilmington, N. C.	7.00 – 7.25	7.25 – 7.50
Charleston, S. C.	7.00 – 7.25	7.25 – 7.50
Savannah	7.00 – 7.25	7.25 – 7.50
Jacksonville	7.00 – 7.25	7.25 – 7.50
Portland	7.00 – 7.50	7.25 – 7.75
Boston	6.50 – 7.25	6.75 – 7.50
Providence	6.50 – 7.25	6.75 – 7.50

(a) Prices are nominal. (b) Barge lots.

WATER WHITE KEROSINE

District:			
N. Y. harbor	5.50 –5.75	Charleston	6.00
(b)N. Y. harbor	5.375–5.625	Savannah	5.75
Philadelphia	5.75 –6.00	Jacksonville	5.75
Baltimore	6.00	Portland	6.225– 6.50
Norfolk	6.00	Boston	5.75 – 6.00
Wilmington, N.C.	6.00	Providence	5.75 – 6.00

(b) Barge ots.

(c)FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	5.50 – 5.75	5.375– 5.625
Nos. 2-3	4.50 – 4.75	4.375– 4.625
No. 4	4.50 – 4.75	4.375– 4.625
No. 5	$1.35	.....
No. 6	$1.05 –$1.15	.....
	Phila. dist.	**Balt. dist.**
No. 1	5.75 – 6.00	6.00
Nos. 2-3	4.75 – 5.00	4.75 – 5.00
No. 4	4.50 – 4.75	4.75 – 5.00
No. 5	$1.26 –$1.35	$1.35
No. 6	$1.15	$1.15
	Bost. dist.	**Prov. dist.**
No. 1	5.75 – 6.00	5.75 – 6.00
Nos. 2-3	4.75 – 5.00	4.75 – 5.00
No. 4	4.75 – 5.00	4.75 – 5.00
No. 5	$1.35	$1.35
No. 6	$1.15	$1.15

(c) Fuel oils meet specifications of U. S. Commercial Standards CS12-35.

District:	(b)Bunker C Fuel	(b)Diesel Oil
N. Y. harbor	(e)$1.15	(d)$1.85
Philadelphia	(e)$1.15	(d)$1.85
Baltimore	(e)$1.15	(d)$1.95
Norfolk	(e)$1.15	$2.10
Charleston	$1.10	$2.10
Savannah	(e)$1.10	$2.205
Jacksonville	(e)$1.10	$2.205
Tampa	(e)$1.05	$2.205
Portland	$1.25	$2.25
Boston	(e)$1.15	(d)$1.95
Providence	$1.15	$1.95

(b) In ship's bunkers.
(c) For barging add 5c per bbl.
(d) For barging add 6.5c to 7.5c per bbl.
(e) For barging add 5c to 6c per bbl.

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	4.50 – 4.75	4.50 – 4.75
Philadelphia dist.	4.75 – 5.00	....
Baltimore dist.	5.00	....
Norfolk dist.	5.00	....
Savannah dist.	....	5.00
Jacksonville dist.	....	5.00

Pacific Export

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	April 4	Mar. 28
U. S. Motor, under 65 oct.	5.25 – 5.375	5.25 – 5.375
400 e.p. blend, under 65 oct.	5.375– 5.50	5.375– 5.50
400 e.p. blend 65 oct. & above	5.50 – 5.625	5.50 – 5.675
(b)38-40 w.w.kerosine	4.50 – 5.00	4.50 – 5.00
41-43 w.w kerosine	5.00 – 5.50	5.00 – 5.50
44 w.w. kerosine	5.50	5.50
In Cargo lots, per bbl.		
Diesel fuel, 24° & above	$1.45 –$1.50	$1.45 –$1.50
Diesel fuel, under 24°	$1.40 –$1.45	$1.40 –$1.45
(b)30-34 diesel(gas oil)	$1.45 –$1.65	$1.45 –$1.65
(c)Grade C fuel oil	$0.80 –$0.90	$0.80 –$0.90

Note: For San Francisco cargo prices, add 5c per bbl. to above cargo prices.

(b)150 fire point.

In Ships' Bunkers, or deep tank lots, per bbl.:

(b)Diesel fuel oil	$1.625–$1.65	$1.625–$1.65
(c)Grade C fuel oil	$0.90 –$1.00	$0.90 –$1.00

(b) Pacific specification 200. (c) Pacific specification 400.

Prices Effective	April 4	Mar. 28
Cased Goods: (Per case		
U. S. Motor	$1.45 –$1.575	$1.45 –$1.575
400 e.p. blend, under 65 octane	$1.55 –$1.65	$1.55 –$1.65
400 e.p. blend, 65 oct. & above	$1.65 –$1.75	$1.65 –$1.75
(b)40-43 w.w. kerosine	$1.35 –$1.45	$1.35 –$1.45
Kerosine, p.w.	$1.30 –$1.40	$1.30 –$1.40

(b)150 fire point.

New York Export

(Prices in cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	23.00 –23.50	23.00 –23.50
Dark, 25 p.t.	22.50 –23.00	22.50 –23.00
Neutral oil:		
200 3 color, 25 p.t.	24.50 –25.00	24.50 –25.00
150 3 color, 25 p.t.	22.50 –23.00	22.50 –23.00
600 Warren E filtered	20.50 –21.00	20.50 –21.00
600 s.r., unfiltered	16.00 –16.50	16.00 –16.50
650 s.r., unfiltered	18.00 –18.50	18.00 –18.50
600 fl., s.r.	18.50 –19.00	18.50 –19.00
630 fl., s.r.	21.50 –22.00	21.50 –22.00

Wax, Domestic *and* Export

(Prices in cents per lb. Tests made by A. S. T. M. methods. Melting points shown below, however, are A. M. P., 3° higher than A. S. T. M. (E.M.P.) melting points. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans districts, in bags, carload lots, with 0.2c discount allowed for shipment in bulk. Scale, solid and fully refined, slabs in bags.)

Prices Effective	April 4	
	New York	
	Domestic	Export
124-6 Y.C. scale	1.85 – 2.00	1.85 – 2.00
122-4 W.C. scale	1.85 – 2.00	1.85 – 2.00
124-6 W.C. scale	1.85 – 2.00	1.85 – 2.00
123-5 Fully rfd.	4.30	3.75
125-7 Fully rfd.	4.35	3.875
128-30 Fully rfd.	4.45	4.125
130-2 Fully rfd.	4.55	4.25
133-5 Fully rfd.	(a)5.00	4.75
135-7 Fully rfd.	(a)5.25	5.125
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	1.85 – 2.00	1.85 – 2.00
122-4 W.C. scale	1.85 – 2.00	1.85 – 2.00
124-6 W.C. scale	1.85 – 2.00	1.85 – 2.00
123-5 Fully rfd.	4.30	3.75
125-7 Fully rfd.	4.35	3.875
128-30 Fully rfd.	4.45	4.125
130-2 Fully rfd.	4.55	4.25
133-5 Fully rfd.	(a)5.00	4.75

(b) Shipment either in bags or in bulk.

Gulf Coast

(Prices are f.o.b. ship at Gulf oil terminals representing opinions of majority of traders, except prices specified to the contrary. Prices cover bulk shipments of 20,000 bbls. or more, unless otherwise noted.)

Prices Effective	April 4	Mar. 28
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	5.00 – 5.125	(a) 5.00 –5.125
60-64 oct. number	5.125– 5.25	(a) 5.125–5.375
65-67 octane	5.25 – 5.375	(a) 5.25 –5.50
68-70 octane	5.375– 5.625	(a) 5.375–5.625
FUEL OILS		
No. 1	4.50 – 4.625	4.50 – 4.625
No. 2	3.625	3.625– 4.00
KEROSINE		
41-43 w w	4.50 – 4.625	4.50 – 4.625
For Export Shipment:		
GASOLINE		
U. S. Motor	4.75 – 4.875	4.875– 5.00
60-62, 400 e.p.	4.75 – 4.875	4.875– 5.00
61-63, 390 e.p.	4.875– 5.00	5.00 – 5.125
64-66, 375 e.p.	4.875– 5.00	5.00 – 5.125
KEROSINE		
44 w.w.	(a) 4.625–4.875	(a) 4.625–4.875
41-43 w.w.	4.50 – 4.625	4.50 – 4.625
41-43 p.w.	4.50 – 4.625	4.50 – 4.625

(a) Nominal.

GAS AND BUNKER OILS

For Export Shipment

Gas Oil (a) and (b):		
Below 43 diesel index	3.625	.....
43-47 diesel index	3.625	.....
48-52 diesel index	(d)3.75	.....
53-57 diesel index	(d)3.875–4.00	.....
58 & above diesel index	(c)	.....

(a) Recognizing the change which has taken place generally in trade practice in the market for export gas oil at the American Gulf within the past year, National Petroleum News, beginning with this issue, is quoting this product on a simple diesel index basis. (b) Less than ½ of 1% sulfur. (c) No prices reported. (d) Nominal.

Prices Effective	April 4	Mar. 28
For Domestic and /or Export Shipment		
Diesel Oil Ship's bkrs.	(a)$1.75	(c)$1.75
Grade C bunker oil for ship's bunkers	(a)$0.85	(c)$0.85
Grade C bunker oil, in cargoes	$0.75	$0.75

(a) Barging 5c bbl. additional at some Gulf ports.

MEXICAN CRUDE AND BUNKER OILS

(F.o.b. Steamer, Tampico)

Heavy Panuco crude, taxes to be paid	(b)	(b)
Grade C bunker oil, ship's bunkers, taxes paid	(b)	(b)

(b) No prices available.

MID-CONTINENT LUBRICATING OILS

(Prices in cents per gal. for export shipment, f.o.b. Gulf in bulk, f.a.s. Gulf in bbls.)

	April 4	
	(b)Barrels	Bulk
190-200 vis. D 210 brt. stock	23.50 –24.50	18.00 –20.50
150-160 vis. D 210 brt. stock:		
0-10 p.p.	19.50 –20.50	14.50 –15.00
10-25 p.p.	19.00 –20.00	14.00 –14.50
150-160 vis. E 210 brt. stock	19.00 –20.00	14.00 –14.50
120 vis. D 210 brt. stock:	19.00 –20.00	14.00 –14.50

(b) Second hand barrels

	April 4	Mar. 28
	Bulk	Bulk
180 vis. No. 3 color neutral:		
0-10 p.p.	8.25	8.25
15-30 p.p.	8.00	8.00
200 vis. No. 3 color neutral:		
0-10 p.p.	8.75	8.75
15-30 p.p.	8.50	8.50
600 s.r. olive green	9.00 –11.25	9.00 –11.25
600 s.r. dark green	7.00 – 9.25	7.00 – 9.25

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° cold test 0, bulk export shipment, f.o.b Gulf oil terminals.)

Unfiltered Pale Oils:		
Vis. Color		
100 No. 3	5.25 – 5.50	5.25 – 5.50
200 No. 3	7.00 – 7.25	7.00 – 7.25
300 No. 3	7.50 – 7.75	7.50 – 7.75
500 No. 3½	8.50 – 8.75	8.50 – 8.75
750 No. 4	9.00 – 9.25	9.00 – 9.25
1200 No. 4	9.50 – 9.75	9.50 – 9.75
2000 No. 4	9.75 –10.25	9.75 –10.25
Red Oils:		
Vis. Color		
100 No. 5-6	5.25 – 5.50	5.25 – 5.50
200 No. 5-6	7.00 – 7.25	7.00 – 7.25
300 No. 5-6	7.50 – 7.75	7.50 – 7.75
500 No. 5-6	8.50 – 8.75	8.50 – 8.75
750 No. 5-6	9.00 – 9.25	9.00 – 9.25
1200 No. 5-6	9.50 – 9.75	9.50 – 9.75
2000 No. 5-6	9.75 –10.25	9.75 –10.25

Note: Red oil prices shown above cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 lbs., British sterling; to U. S. ports in cents per bbl.)

Rates Effective April 4

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.(b)	19/6	20/-21/	20/	20/6-21/6
Aruba-U.K./Cont.(b)	17/6	18/-19/	18/	18/-19/
Gulf-N. Atlantic (c) (not E. of N.Y.): Hvy. Crude & fuel, (10 to 19.9 gravity)	17.5c	16c-18c	....	....
Light Crude, (30 Grav. or Lighter)	15c	15c-17c	....	....
Gasoline	....	....	16c	17c
Kerosine	....	....	18c	18c
Light Fuel	....	....	18c	19c

(a) Nominal.
(b) Continental ports in range between Bordeaux and Hamburg, both inclusive.
(c) Venezuela loading same rate: Tampico 2c to 3c per bbl. additional.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective March 7, 1938, except Corning Sept. 2, 1937)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.71
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.65
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.55
Corning Oil in Buckeye Pipe Lines (Ohio)...$1.27

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective March 7, 1938).....$2.05
*The Pennzoil Co.: (Effective March 7, 1938)
Penna. Grade Oil in National Transit Lines*$1.98
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.):
(Effective Jan. 28, 1937)
Big Sandy River.....$1.42
Kentucky River.....$1.50

*The Pennzoil Co. posts $1.98 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $1.93 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland; Midland County (Jan. 5, 1938)....$1.12

Posted by Simrall Pipe Line Corp.

(Effective Dec. 29, 1937)

West Branch, Arenac, and equal grades.....$0.80

(Effective Jan. 8, 1938)

Beaverton, Crystal, Greendale, Porter and equal grades.....$1.12
Buckeye, Bentley, Billings, Tobacco and equal grades.....$1.095

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Illinois, Princeton.....$1.35
Owensboro (Western Ky.).....$1.40

(Effective Nov. 20, 1937)

Lima, O.....$1.00

Posted by Stoll Oil Refining Co.

(Effective Feb. 1, 1937)

Stoll Pipe Line Oil (Ky.).....$1.40

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

(Effective Jan. 5, 1938)

Crude Oil

40-40.9°	$1.14	53-53.9	$1.40
41-41.9	1.16	54-54.9	1.42
42-42.9	1.18	55-55.9	1.44
43-43.9	1.20	56-56.9	1.46
44-44.9	1.22	57-57.9	1.48
45-45.9	1.24	58-58.9	1.50
46-46.9	1.26	59-59.9	1.52
47-47.9	1.28	60-60.9	1.54
48-48.9	1.30	61-61.9	1.56
49-49.9	1.32	62-62.9	1.58
50-50.9	1.34	63-63.9	1.60
51-51.9	1.36	64-64.9	1.62
52-52.9	1.38		

Crude Naphtha, 65 grav. & above.....$2.14

Absorption Gasoline

90% Rec., 20 lb. Reid v.p.....$1.94
90% Rec., 17 lb. Reid v.p.....$2.08

MID-CONTINENT

Posted by Stanolind Crude Oil Purchasing Co., Jan. 28, 1937

	(In Oklahoma-Kansas*)	(In North-North Central Texas)
Below 29	$1.06	$0.96
29-29.9	1.08	0.98
30-30.9	1.10	1.00
31-31.9	1.12	1.02
32-32.9	1.14	1.04
33-33.9	1.16	1.06
34-34.9	1.18	1.08
35-35.9	1.20	1.10
36-36.9	1.22	1.12
37-37.9	1.24	1.14
38-38.9	1.26	1.16
39-39.9	1.28	1.18
40 & above	1.30	1.20

Above Stanolind prices met as follows:
Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas, Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.
Note: Stanolind prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 100% tank tables are used effective Oct. 1, 1937, volume corrected to 60° F., and deduction for full b.s. & w. content.
*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.

In Oklahoma

(Effective Jan. 28, 1937)

Below 25	$0.98	33-33.9	$1.16
25-25.9	1.00	34-34.9	1.18
26-26.9	1.02	35-35.9	1.20
27-27.9	1.04	36-36.9	1.22
28-28.9	1.06	37-37.9	1.24
29-29.9	1.08	38-38.9	1.26
30-30.9	1.10	39-39.9	1.28
31-31.9	1.12	40 and above...	1.30
32-32.9	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Bransdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.

(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

Beaumont, Tex.

(Effective Oct. 1, 1937)

Below 21°	$0.95	27-27.9	$1.15
21-21.9	0.98	28-28.9	1.17
22-22.9	1.01	29-29.9	1.19
23-23.9	1.04	30-30.9	1.21
24-24.9	1.07	31-31.9	1.23
25-25.9	1.10	32-32.9	1.25
26-26.9	1.13	33-33.9	1.27
		34 & above	1.29

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

(*West Central Texas)

(Effective Jan. 28, 1937)

Below 29	$0.96	35-35.9	$1.10
29-29.9	0.98	36-36.9	1.12
30-30.9	1.00	37-37.9	1.14
31-31.9	1.02	38-38.9	1.16
32-32.9	1.04	39-39.9	1.18
33-33.9	1.06	40 and above...	1.20
34-34.9	1.08		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Shell Petroleum Corp., effective Jan. 28, posts Humble's above schedule on Fisher county crude, plus these five lower grades, beginning with below 25 gravity at $0.88; 25-25.9, $0.90; 26-26.9, $0.92; 27-27.9, $0.94, and 28-28.9, $0.96; rest of schedule same as Humble's in West Central Texas.
Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

*East Central Texas

(Effective Jan. 28, 1937)

Below 29	$1.03	35-35.9	$1.17
29-29.9	1.05	36-36.9	1.19
30-30.9	1.07	37-37.9	1.21
31-31.9	1.09	38-38.9	1.23
32-32.9	1.11	39-39.9	1.25
33-33.9	1.13	40 and above...	1.27
34-34.9	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.
Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

	Gray County	Carson-Hutchinson
Below 35	$0.96	$0.91
35-35.9	0.98	0.93
36-36.9	1.00	0.95
37-37.9	1.02	0.97
38-38.9	1.04	0.99
39-39.9	1.06	1.01
40 & above	1.08	1.03

Jan. 28, above prices met by Sinclair-Prairie and Magnolia in the entire area and by Continental in Carson-Hutchinson and by Texas Co. in Panhandle Sweet, same as Humble's Gray Co. and on Panhandle Sour, same as Carson-Hutchinson.

EAST TEXAS

(Effective May 22, 1937)

Stanolind, Humble, Shell, Sinclair-Prairie, Texas Co., and Magnolia.....$1.35

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco.....$0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex.:
Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company.

(Posted by The Texas Co., Jan. 28, 1937)

Cass County.....$1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

(Including Andrews, Crane, Crockett, Ector, Glasscock, Howard, Winkler and Upton Counties, Texas and Lea county, New Mexico).

Below 26	$0.78	33-33.9	$0.94
26-26.9	0.80	34-34.9	0.96
27-27.9	0.82	35-35.9	0.98
28-28.9	0.84	36-36.9	1.00
29-29.9	0.86	37-37.9	1.02
30-30.9	0.88	38-38.9	1.04
31-31.9	0.90	39-39.9	1.06
32-32.9	0.92	40 & above	1.08
Pecos, West Texas			$0.91

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winkler.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil & Gas Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Artesia, Jackson and Maljamar pools, N. M...$0.90

COLORADO

(Posted by Continental Oil Co.,
Effective Jan. 28, 1937)
Ft. Collins and Wellington

Below 29	$1 01	35-35.9	$1.15
29-29.9	1.03	36-36.9	1.17
30-30.9	1.05	37-37.9	1.19
31-31.9	1.07	38-38.9	1.21
32-32.9	1.09	39-39.9	1.23
33-33.9	1.11	40 & above	1.25
34-34.9	1.13		

Cannon City and Florence, Col.....$1.10

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski fields.....$1.09
Pettus.....$1.37 Van Zandt.....$1.10

Jan. 28, Magnolia met Humble in Darst Creek; posted $1.00 in Luling; $1.12 in Lytton Springs; $1.27 for Cleveland, and $1.15 in Hardin, both in Liberty county, Tex.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Anahuac, Dickinson, Flour Bluff and Turtlebay

(Effective Jan. 28, 1937)

Below 31	$1.16	36-36.9	$1.28
31-31.9	1.18	37-37.9	1.30
32-32.9	1.20	38-38.9	1.32
33-33.9	1.22	39-39.9	1.34
34-34.9	1.24	40 and above	1.36
35-35.9	1.26		

Conroe, Raccoon Bend (Deep sand crude) Tomball and Satsuma

(Effective Jan. 28, 1937)

Below 29	$1.20	35-35.9	$1.34
29-29.9	1.22	36-36.9	1.36
30-30.9	1.24	37-37.9	1.38
31-31.9	1.26	38-38.9	1.40
32-32.9	1.28	39-39.9	1.42
33-33.9	1.30	40 & above	1.44
34-34.9	1.32		

Jan. 28, Magnolia met Humble in Tomball and Texas Co. met Humble in Conroe, beginning with 35-35.9 gravity.

(Continued on next page)

CRUDE OIL MARKETS

(*Continued from preceding page*)

South-Southwest Texas (cont'd)

Posted by Humble

**Mirando*

(Effective July 6, 1937)

Below 21	$0.96	31-31.9	$1.18
21-21.9	0.98	32-32.9	1.20
22-22.9	1.00	33-33.9	1.22
23-23.9	1.02	34-34.9	1.24
24-24.9	1.04	35-35.9	1.26
25-25.9	1.06	36-36.9	1.28
26-26.9	1.08	37-37.9	1.30
27-27.9	1.10	38-38.9	1.32
28-28.9	1.12	39-39.9	1.34
29-29.9	1.14	40 & above	1.36
30-30.9	1.16		

*Includes Duval, Jim Hogg, Webb and Zapata counties, Tex. and Heyser and Placedo crudes.

July 6, Magnolia posted same schedule as Humble in Mirando.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

	*N. La.-Ark.	Rodessa, La.	So. La. Roanoke N. Crowley
	(Effective Jan. 28, 1937)		(Dec. 28,'37)
Below 21°	$0.90	$0.93	$0.90
21-21.9	for	for	.93
22-22.9	oil	oil	.96
23-23.9	Below	Below	.99
24-24.9	25°.	25°.	1.02
25-25.9	$0.92	$0.95	1.05
26-26.9	.94	.97	1.08
27-27.9	.96	.99	1.10
28-28.9	.98	1.01	1.12
29-29.9	1.00	1.03	1.14
30-30.9	1.02	1.05	1.16
31-31.9	1.04	1.07	1.18
32-32.9	1.06	1.09	1.20
33-33.9	1.08	1.11	1.22
34-34.9	1.10	1.13	1.24
35-35.9	1.12	1.15	1.26
36-36.9	1.14	1.17	1.28
37-37.9	1.16	1.19	1.30
38-38.9	1.18	1.21	1.32
39-39.9	1.20	1.23	1.34
40 & above	1.22	1.25	1.36

*Includes Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie and Miller county.

Smackover, Ark. $0.90

Urania, La. (Arkansas Fuel Oil Co., Jan. 28, '37) $1.02

Tepetate, La. (Continental Oil, Jan. 28, '37) ... 1.24

Jan. 28, 1937, Magnolia met S. O. La.'s No. La.-Ark. gravity and price schedule in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., and in Eldorado and Rainbow districts, Ark.; and met S. O. La.'s Rodessa prices; and in Lockport, Iowa, Cameron Meadow, La., posted Humble's gravity and price schedule on Mirando. El Dorado East Field, Ark. price same as Smackover, effective Jan. 28, '37.

Jan. 28, The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. and $0.90 for Smackover.

***GULF COASTAL FIELDS**

Posted by Humble Oil & Refining Co. and The Texas Co.

	(Effective Jan. 28, 1937) Humble	Texas	Saxet (Humble) (July 6 '37)
Below 18	$0.95	$0.90	....
18-18.9	for	0.92	....
19-19.9	below	0.94	....
20-20.9	21°	0.96	$1.01
21-21.9	0.98	0.98	1.03
22-22.9	1.01	1.01	1.05
23-23.9	1.04	1.04	1.07
24-24.9	1.07	1.07	1.09
25-25.9	1.10	1.10	1.11
26-26.9	1.13	1.13	1.13
27-27.9	1.15	1.15	1.15
28-28.9	1.17	1.17	1.17
29-29.9	1.19	1.19	1.19
30-30.9	1.21	1.21	1.21
31-31.9	1.23	1.23	1.23
32-32.9	1.25	1.25	1.25
33-33.9	1.27	1.27	1.27
34-34.9	1.29	1.29	1.29
35-35.9	1.31	for	1.31
36-36.9	1.33	oil	1.33
37-37.9	1.35	34°	1.35
38-38.9	1.37	and	1.37
39-39.9	1.39	above.	1.39
40 and above	1.41	....	1.41

†Refugio

(Effective July 6, 1937)

Posted by Humble

20-20.9	$1.01	23-23.9	$1.07
21-21.9	1.03	24-24.9	1.09
22-22.9	1.05	25-25.9	1.11

Rest of schedule same as Humble's Gulf Coastal crude prices.

†Includes Saxet, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor crude.

*Humble's prices apply in these Texas fields: Amelia, Barbers Hill, Goose Creek, Hull, Liberty, Mykawa, Orange, Pierce Junction, Raccoon Bend, (shallow sand), Sugarland, Thompsons, and West Columbia. Same prices also apply, effective Feb. 1, 1938, in Clinton, Tex., posted by Stanolind Crude Oil Purch. Co.

Jan. 28, Sinclair-Prairie met above Humble schedule in full.

July 6, 1937, The Texas Co. posted for Refugio, which includes Greta, Saxet and Taft: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above.

Texas Co. postings in Gulf Coastal Texas include: Arriola, Five Corners, Ganado, Humble, Liberty, Magnet, Manvel, Markham, Mauritz, McFaddin, Pickett Ridge, Port Neches, Sour Lake, West Columbia and Withers. In Gulf Coastal Louisiana: Bay St. Elaine, Caillou Island, Dog Lake, Four Isle, Gillis, Horseshoe Bayou, Iberia, Lake Barre, Lake Pelto, Leesville and Port Barre.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

(Effective Jan. 6, 1938)

Tensleep, Salt Creek field	$0.70

(Effective Jan. 28, 1937)

Greybull-Torchlight	$1.30
Iles, light, Col.	1.18
Iles, heavy	1.12
Hogback, N. M.	1.33
Big Muddy	1.23
Elk Basin, light	1.30
Grass Creek, light	1.30
Frannie light	0.82

(Effective Nov. 4, 1936)

Grass Creek, heavy	$0.62
Frannie heavy	0.62
Hamilton Dome, Wyo.	0.57

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Elk Basin, Wyo.	$1.30
Grass Creek, light	1.30
Rock Creek	1.205
Lance Creek	0.97

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.

(Effective Jan. 1, 1938)

Cat Creek, Mont.	$1.30

(Effective Jan. 28, 1937)

Big Muddy, Wyo.	1.18
Lance Creek, Wyo.	0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, Dec. 22, 1937.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$0.80	0.79	0.74	0.78	0.79	0.80	0.76	....	....	0.80	0.76	0.76	0.77	0.78	....	0.70	....	0.70	0.70	....	0.70	0.70	....
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	....	.74	.71	.70
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	....	.78	.72	.70
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	....	.82	.74	.70
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	.77	.87	.87	....	.86	.78	.72
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	.80	.92	.92	....	.90	.82	.76
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	....	.94	.86	.79
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	....	.98	.90	.83
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	....	1.02	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.96	1.06	.95	....	.95	1.10	1.10	$0.84	1.06	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	....	.99	1.15	1.15	.88	1.10	....	....
29-29.9	1.17	1.15	.93	1.18	1.18		1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	.92	1.14	....	....
30-30.9	1.21	1.19	.95	1.22	1.21		1.21	1.17	.95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	.95	1.18	....	....
31-31.9				....	1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	.99			
32-32.9		*Elwood Terrace		....	1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.03	Kettleman Hills		
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.07	....	1.19	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	1.11	....	1.23	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	1.15	....	1.27	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	1.19	....	1.31	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	1.23	....	1.35	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	1.27	....	1.39	....
39-39.9	....	....	....	....	....		....	1.61	....	....	....	....	1.40	....	....	....	....	....	....	1.31	....	1.43	....
40-40.9	....	....	....	....	....		....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	1.34	....	....	....
41-41.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.38	....	....	....
42-42.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.41	....	....	....
43-43.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.45	....	....	....
44-44.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.49	....	....	....
45-45.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.53	....	....	....
46-46.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.56	....	....	....
47-47.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.60	....	....	....
48-48.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.64	....	....	....

F. O. B. Standard Pipe Line

*F. o. b. ship.

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Coming Meetings

Oil Burner Institute, annual meeting, Palmer House, Chicago, Ill., April 11 and 12.

National Petroleum Assn., Cleveland, Ohio, April 13 and 14.

Petroleum Industry Electrical Assn., Rice Hotel, Houston, Texas, April 13, 14 and 15.

American Petroleum Institute, division of production, Eastern District, William Penn Hotel, Pittsburgh, Pa., April 14 and 15.

Society of Automotive Engineers, Inc., National Tractor meeting, Schroeder Hotel, Milwaukee, Wis., April 14 and 15.

West Virginia Petroleum Assn., first annual convention, Daniel Boone Hotel, Charleston, W. Va., April 15.

American Chemical Society, Dallas, Texas, April 17 to 21.

American Petroleum Institute, division of production, Pacific Coast district, spring meetings, Biltmore Hotel, Los Angeles, Calif., April 19.

Greater New York Safety Council, Hotel Astor, New York City, April 19, 20, 21.

American Institute of Mining and Metallurgical Engineers, Open Hearth Conference, Buffalo, N. Y., April 20, 21, and 22.

The Credit Men's Association of Eastern Pa., Petroleum Refiners & Marketers Credit Groups of Eastern and Western Pa., Penn-Harris Hotel, Harrisburg, Pa., April 25 and 26.

Western Petroleum Refiners Assn., 26th annual meeting, Hotel Arlington, Hot Springs, Ark., April 25, 26 and 27.